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CHOWAN RIVER BASIN

POLLUTION SURVEY REPORT

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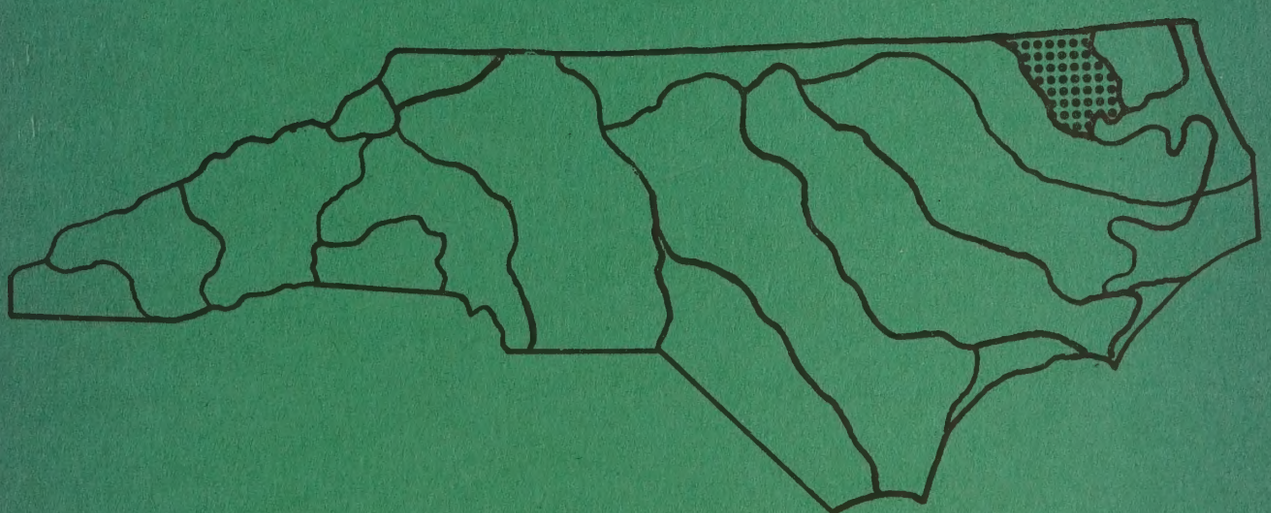

STATE STREAM SANITATION COMMITTEE
NORTH CAROLINA STATE BOARD O HEALTH
1955

POLLUTION SURVEY
REPORT NO. 3

THE CHOWAN RIVER BASIN

A study of existing pollution in the Chowan River Basin together with recommended classifications of its waters.

STATE STREAM SANITATION COMMITTEE

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NORTH CAROLINA STATE BOARD OF HEALTH
RALEIGH, NORTH CAROLINA

CONTENTS

	Page
Introduction	3
Acknowledgment	5
Summary	7
Conclusions	9
General Description	19
Historical	19
Location and Area	19
Topography	20
Cover and Climate	20
Stream Flow	20
Economic Development	23
Population	23
Industry	23
Commercial Fisheries	23
Other Industries	24
Power	24
Geology	24
Forest Resources	25
Agriculture	25
Recreation	26
Transportation	26
The Survey	29
General	29
Sampling Stations and Procedures	29
Hydrological Measurements	30
Laboratory Tests and Their Significance	30
Classifications and Water Quality Standards	35
General Survey Findings	49
SECTION I - Main Stem and Tributaries from North Carolina - Virginia State Line to Mouth of Meherrin River	49

Page

SECTION II - Main Stem and Tributaries from Mouth of Meherrin River to Atlantic Coast Line Railroad Chowan River Bridge at Tunis 52

SECTION III - Main Stem and Tributaries from Atlantic Coast Line Railroad Chowan River Bridge at Tunis to Mouth with exception of Bathing Areas 53

SECTION IV - Section from Mouth of Chowan River, including Edenton Bay and Adjacent Waters to a Line Extending from Mouth of Blackwalnut Creek to North End of Norfolk - Southern Railroad Albemarle Sound Bridge 56

Maps

Geographic Location of Sampling Stations 11

Geographic Location of Pollution Sources 17

Map of Edenton Bay Showing Average Analytical Results 111

Map of Colerain Beach Showing Coliform Sampling Points and MPN Values 113

Map of Tuscarora Beach Showing Coliform Sampling Points and MPN Values 115

Map of Chowan Beach Showing Coliform Sampling Points and MPN Values 117

Tables

Table 1 - Sampling Stations Listed In Numerical Order 13

Table 2 - Sampling and Gaging Stations Listed In Downstream Order 15

Table 3 - Public Ground Water Supplies 59

Table 4 - Points of Significant Sources of Pollution 60

Table 5 - Analytical Results 63

Table 6 - Recommended Classifications 101

Graphs

Graph 1 - D.O. and B.O.D. 119

Graph 2 - MPN Coliforms 131

INTRODUCTION

The survey of the surface waters in the Chowan River Basin was conducted during 1953 and this report has been prepared to fulfill the requirements of Section 143-215 of Article 21, General Statutes of North Carolina. The area considered during these studies and covered by this report is that portion of the Chowan River Basin within the State of North Carolina and waters adjacent to its mouth down to a line extending across Albemarle Sound from the mouth of Blackwalnut Swamp to the north end of the Norfolk Southern Railroad Bridge across the Sound, including Edenton Bay. The area considered is shown on the accompanying map entitled "Chowan River Basin, Geographic Location of Sampling Stations," page 11.

The Chowan River is an interstate stream, having its source in Virginia and draining into the west end of Albemarle Sound in North Carolina. It has a total drainage area of 4,929 square miles lying in the States of North Carolina and Virginia. The drainage area of that portion lying within the State of North Carolina, including Edenton Bay and the waters adjacent to the mouth of the river as shown on the map, is 1,262 square miles.

The data on which this report is based have been developed through actual laboratory studies of existing stream conditions, engineering surveys of municipal and industrial water supplies and waste treatment facilities, from information obtained from existing files, and from conferences with persons well acquainted with the area. Data with reference to stream flows, watershed areas, and stream mileages were furnished by the Raleigh District Office, Geological Survey of the United States Department of Interior, under the terms of a co-operative program between that office and the State Stream Sanitation Committee. Other state agencies have also been of considerable assistance in furnishing data with regard to land and stream usage.

The report presents information relative to present stream conditions, usage of the water resources, sources of pollution entering these waters, pollution prevention measures now in effect, and proposed classifications for the waters of the Basin.

Throughout the conduct of these studies and the preparation of this report, a sincere effort has been made to present a fair picture of the complex water pollution problems within the Basin. Likewise, every effort possible has been made toward developing reasonable conclusions and recommendations pertaining to the proposed classifications of the various waters comprising the water resources of the area. It is hoped, therefore, that this report will be useful to all who are concerned with the problem of safeguarding the water resources in the Chowan River Basin.

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ACKNOWLEDGMENT

The State Stream Sanitation Committee wishes to acknowledge the valuable co-operation and assistance of those agencies and individuals who have contributed to the Chowan River Basin studies and the preparation of this report.

Special recognition is given to the officials of industries and municipalities who furnished data relative to plant operations, waste discharges, and treatment facilities employed. Recognition is also given to the Towns of Edenton and Ahoskie for their co-operation in furnishing space and utility services for the mobile laboratory unit located in these towns during the period of the survey.

Federal and State agencies from which co-operation and assistance were obtained include the Geological Survey of the United States Department of Interior; the Division of Water Pollution Control, Public Health Service; U. S. Soil Conservation Service; the State Department of Conservation and Development; the North Carolina Wildlife Resources Commission; the North Carolina State Board of Health, and the State Water Pollution Control Board of Virginia. Assistance was also rendered in numerous instances by County Health Departments, County Departments of Agriculture and other agencies and individuals interested in preserving and developing our water resources. This assistance is hereby gratefully acknowledged.

SUMMARY

The area covered by this report consists of the drainage area of Chowan River in North Carolina, and waters adjacent to its mouth down to a line extending across Albemarle Sound from the mouth of Blackwalnut Swamp to the north end of the Norfolk Southern Railroad Bridge across the Sound, including Edenton Bay. This Basin encompasses an area of approximately 1,262 square miles. The estimated 1950 population of the Basin was 68,953, of which 16,968 or about 25 per cent reside in incorporated towns while 51,985 or 75 per cent live in the rural areas.

Surface water uses in the Basin include industrial water supplies; bathing, boating and other forms of recreation; fish and wildlife propagation; agriculture, including livestock watering and irrigation; and waste disposal.

There are nine public water supplies within the Basin serving approximately 14,459 people who use 1.0 million gallons per day. The 1950 census lists the population of these communities as 14,593. All public water supplies are derived from wells.

There are 25 points of significant pollution within the Basin. These wastes consist of domestic sewage, industrial wastes or combinations of both. The total estimated volume of wastes discharged from these points (excluding wastes from commercial fisheries) is 0.8 million gallons per day, of which approximately 93 per cent is domestic sewage and 7 per cent is industrial wastes.

In addition to the domestic sewage and industrial wastes tributary to the waters of the Basin in North Carolina, the Blackwater, Nottoway and Meherrin Rivers, which drain a considerable area in Virginia, bring into the Chowan River a combined pollution load equivalent to the raw sewage discharges from a population (P. E.) of 50,980.

The domestic sewage and industrial waste discharges in North Carolina, excluding wastes from commercial fisheries, have a combined P. E. of 15,633, which added to the pollution load in the streams entering the State from Virginia result in a total loading having a P. E. of 66,613.

On a population equivalent (P. E.) basis, 80 per cent of the pollution originating in North Carolina is derived from domestic sewage while 20 per cent is due to industrial wastes. Treatment of these wastes, ranging from none to complete treatment, reduces the pollution load tributary to the Basin waters from a P. E. of 15,633 to a P. E. of 14,458, representing a reduction due to treatment of only 8 per cent.

About 61 per cent of the total volume of all liquid wastes, domestic and industrial, originating in the Basin are discharged without treatment. The major portion of these wastes, 56 per cent, is contributed by the Towns of Edenton and Murfreesboro where no treatment facilities are provided and by Ahoskie where approximately one-half of the domestic sewage and the industrial wastes from two small plants are discharged raw into Ahoskie Creek.

The total estimated domestic sewage population equivalent of the wastes discharged from Virginia into North Carolina via the Blackwater, Nottoway, and Meherrin Rivers is approximately three times the total estimated pollution load originating in North Carolina.

From the foregoing, it can be seen that the pollution tributary to the streams of the Basin is greater in Virginia than in North Carolina; however, additional sewage and industrial waste treatment plants are needed and should be provided in North Carolina as well as in Virginia. Better maintenance and proper operation of all existing facilities would also improve stream conditions. Wastes from the commercial fisheries provide a significant industrial waste problem and steps should be taken by these industries to minimize their waste loads during their operating season.

CONCLUSIONS

From a review of the data in this report, it is concluded that:

1. The Chowan River Basin is rich in natural resources including fertile land, large forests, and an abundance of water.

2. The waters of the Basin are not presently used to their utmost. There is an adequate quantity of both ground and surface water to sustain reasonable industrial expansion, population growth, recreational development and for other legitimate uses provided a comprehensive water pollution control program is maintained.

3. The surface waters of the Basin are not extensively damaged by pollution; however, in some local areas, the water resources have been damaged. Meherrin River in the vicinity of Murfreesboro, Ahoskie Creek at Ahoskie, and Edenton Bay are being damaged by discharges of raw sewage from Murfreesboro, Ahoskie, and Edenton.

4. The Blackwater, Nottoway, and Meherrin Rivers are discharging into North Carolina large quantities of municipal and industrial wastes from Virginia.

5. Municipal pollution from Winton and Colerain are affecting recreational uses of Chowan River at Tuscarora and Colerain Beaches.

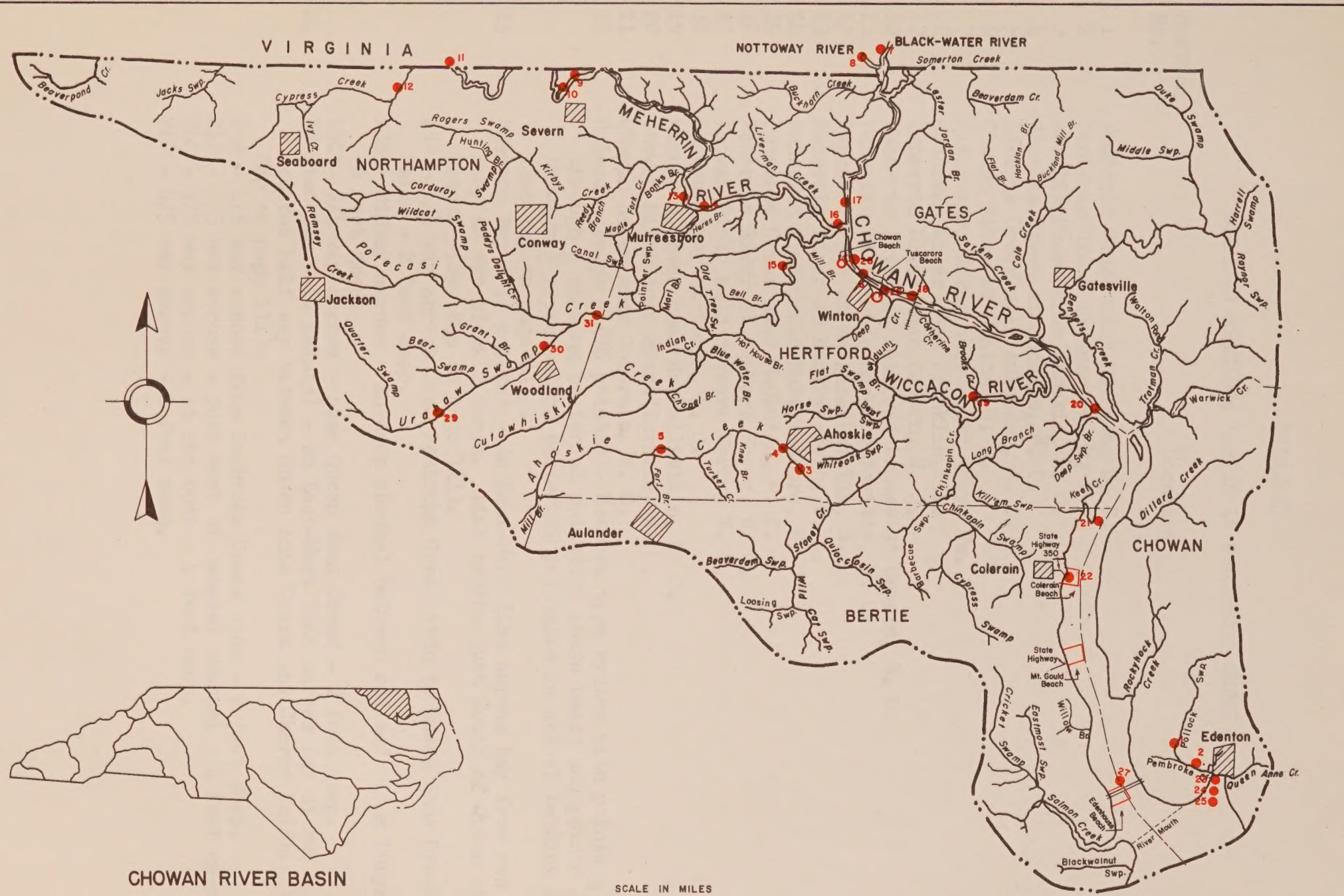
6. Both population and industrial development are increasing in the Basin. In order to insure this continued growth, steps must be taken to reduce present pollution and to insure that future polluters provide adequate waste treatment.

7. The commercial fish houses are polluting the waters around their establishments. These establishments should take steps to minimize their waste discharges.

8. There are locations, especially adjoining the lower segment of the Chowan River, that provide excellent sites for industrial growth.

9. Municipalities and industries should obtain or train personnel to study their waste disposal problems, and to determine necessary waste treatment facilities.

10. The recommended classifications of the streams are listed in Table 6 beginning on page 101. These classifications have been selected on the basis of the present or foreseeable future usage for which these waters must be protected in the interest of the public. It is, therefore, the Committee's belief that they should be adopted.



CHOWAN RIVER BASIN

GEOGRAPHIC LOCATION OF SAMPLING STATIONS

SCALE IN MILES

5 0 5 10

STATE STREAM SANITATION COMMITTEE
N. C. STATE BOARD OF HEALTH
RALEIGH, N. C.
1954

TABLE 1

SAMPLING STATIONS LISTED IN NUMERICAL ORDER

Station No.	Location
1	Pembroke Creek near Edenton, N. C.
2	Pembroke Creek at Edenton, N. C.
3	Ahoskie Creek near Ahoskie, N. C.
4	Ahoskie Creek at Ahoskie, N. C.
5	Ahoskie Creek near Aulander, N. C.
6	Chowan River at Winton, N. C.
7	Blackwater River near South Quay, Va.
8	Nottoway River near Franklin, Va.
9	Meherrin River near Severn, N. C.
10	Meherrin River at railroad bridge at Severn, N. C.
11	Meherrin River near Margarettsville, N. C.
12	Cypress Creek at Margarettsville, N. C.
13	Meherrin River at Murfreesboro, N. C.
14	Meherrin River near Murfreesboro, N. C.
15	Potecasi Creek near Mapleton, N. C.
16	Meherrin River at Parkers Ferry, N. C.
17	Chowan River near Parkers Ferry, N. C.
18	Chowan River at Tunis, N. C.
19	Wiccacon River near Harrellsville, N. C.
20	Chowan River near Harrellsville, N. C.
21	Chowan River near Colerain, N. C.
22	Colerain Beach - (16 points) - Network type system with points A through I showing bacterial pollution above beach and points J through P representing bacterial pollution in actual bathing area. (See Map on page 113).
23	Edenton Bay - (3 points) - An East-West line across bay from red S buoy to two black S buoys. Line begins just South of Queen Anne Creek. (See Map on page 111).
	23A - 1/4 way across from Pembroke Creek side to Queen Anne Creek side - 2 feet deep.
	23B - Midway across - in deep channel between red and black bucys - 6 feet deep.
	23C - 3/4 way across - near Queen Anne Creek - 2 feet deep.
24	Edenton Bay - (4 points) - An East-West line across Bay at red buoy located half way between Queen Anne Creek and Cherry Point. (See Map on page 111).
	24A - 1/5 way across from Pembroke Creek side - 2 feet deep.
	24B - 2/5 way across - just West of deepest channel - 4 feet deep.
	24C - 3/5 way across - at red buoy - 4 feet deep.
	24D - 4/5 way across - 2 feet deep.

Station No.	Location
25	Edenton Bay - (5 points) - An East-West line across bay - to Cherry Point to Flashing Red 4-second bell - and end of land at Reedy Point. (See Map on page 111).
	25A - 1/6 way across from Reedy Point - 3 feet deep.
	25B - 1/3 way across - 6 feet deep.
	25C - 1/2 way across - just West of bell light - 7 feet deep.
	25D - 2/3 way across - 3 feet deep.
	25E - 5/6 way across - just off Cherry Point - 2 feet deep.
26	Tuscarora Beach - (9 points) - Rectangular network covering bathing area. Points A, B, C, constituting the upstream end; D, E, F, the center of the beach; and G, H, I, the downstream end of the beach. (See Map on page 115).
27	Chowan River near Edenton, N. C.
28	Chowan Beach - (9 points) - Rectangular network covering bathing area. Points A, B, C, constituting the upstream end; D, E, F, the center of the beach; and G, H, I, the downstream end of the beach. (See Map on page 117).
29	Urahaw Swamp near Rich Square, N. C.
30	Urahaw Swamp near Woodland, N. C.
31	Potecasi Creek near Woodland, N. C.

TABLE 2

SAMPLING AND GAGING STATIONS LISTED IN DOWNSTREAM ORDER

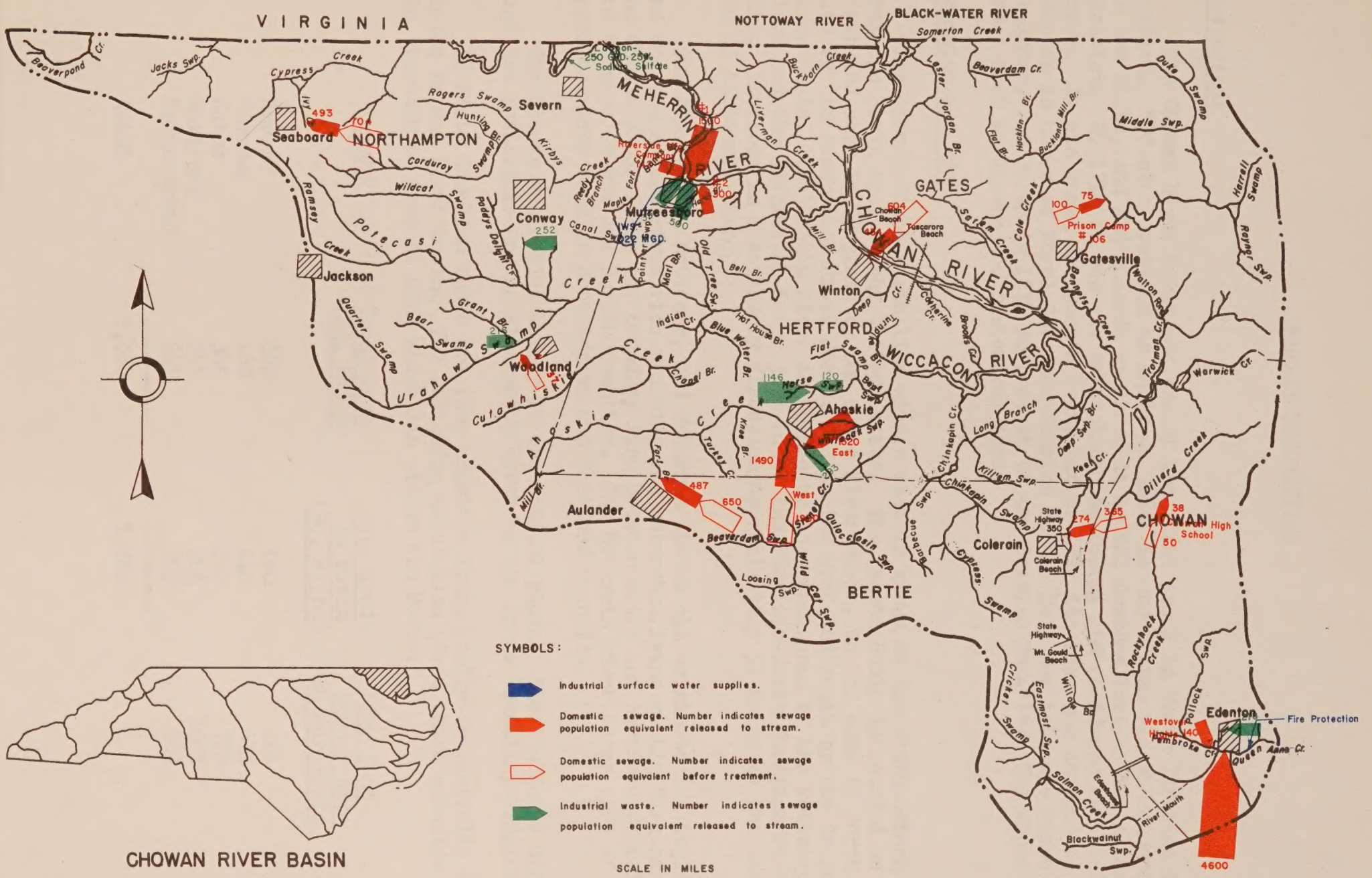
Sta. No.	Location	Stage Ref.	Miles from River Mouth or Mouth of Tributary	Drainage Area in Sq. Miles
	Nottoway River near Sebrell, Va.	R.	85.1 *	1451
8	Nottoway River near Franklin, Va.		55.6 *	1742
	Nottoway River at N.C. State Line		52.5 *	
	Blackwater River near Franklin, Va.	R.	24.2 a	613
7	Blackwater River near South Quay, Va.	S.G.	8.6 a	719
	Blackwater River at N.C. State Line		0.6 a	
	Chowan River at confluence of Nottoway and Blackwater Rivers		52.2 *	
	Buckhorn Creek near Como, N.C.	R.P.	4.9 a	7.34
	Chowan River at mouth of Buckhorn Creek		51.0 *	
	Somerton Creek near Cleopus, Va.	R.P.	11.3 a	87.2
	Chowan River at mouth of Somerton Creek		49.8 *	
17	Chowan River near Parkers Ferry, N.C.		41.2 *	2565
	Meherrin River near Lawrenceville, Va.	R.	88.9 a	553
	Meherrin River at Emporia, Va.	R.	68.5 a	749
	Fontaine Creek near Emporia, Va.	C.G.	23.7 b	96.0
	Meherrin River at mouth of Fontaine Creek		45.0 a	
12	Cypress Creek at Margarettsville, N.C.	R.P.	2.0 b	29.8
	Meherrin River at mouth of Cypress Creek		42.1 a	
11	Meherrin River near Margarettsville, N.C.	R.P.	40.4 a	1074
10	Meherrin River at railroad bridge at Severn, N.C.		26.4 a	1115
9	Meherrin River near Severn, N.C.	W.G.	25.6 a	1115
	Kirby Creek near Murfreesboro, N.C.	S.G.	4.0 b	74.6
	Meherrin River at mouth of Kirby Creek		14.3 a	
13	Meherrin River at Murfreesboro, N.C.		11.3 a	1360
14	Meherrin River near Murfreesboro, N.C.		8.4 a	1360
	Potecasi Creek at Potecasi, N.C.	R.P.	30.9 b	53.2
29	Urahaw Swamp near Rich Square, N.C.	R.P.	8.0 b	20.4
30	Urahaw Swamp near Woodland, N.C.	R.P.	2.2 b	51.9
	Potecasi Creek at mouth of Urahaw Swamp		28.1 b	
31	Potecasi Creek near Woodland, N.C.	R.P.	26.5 b	129
	Potecasi Creek near Union, N.C.	R.P.	15.7 b	191
15	Potecasi Creek near Mapleton, N.C.		9.4 b	204
	Meherrin River at mouth of Potecasi Creek		0.6 a	
16	Meherrin River at Parkers Ferry, N.C.		0.4 a	1616
	Chowan River at mouth of Meherrin River		40.9 *	
28	Chowan River at Chowan Beach near Winton		39.9	4186
6	Chowan River at Winton, N. C.		38.3 *	4198
26	Chowan River at Tuscarora Beach near Tunis		36.8	4200

Sta. No.	Location	Stage Ref.	Miles from River Mouth or Mouth of Tributary	Drainage Area in Sq. Miles
18	Chowan River at Tunis, N.C.		35.6 *	4226
	Sarem Creek:			
	Cole Creek near Gatesville, N.C.	S.G.	5.4 b	30.9
	Sarem Creek at mouth of Cole Creek		1.5 a	
	Chowan River at mouth of Sarem Creek		28.8 *	
5	Ahoskie Creek near Aulander, N.C.		37.8 a	43.3
4	Ahoskie Creek at Ahoskie, N.C.	R.	29.9 a	64.3
3	Ahoskie Creek near Ahoskie, N.C.	R.P.	28.4 a	71.7
	Ahoskie Creek near Powellsville, N.C.	R.P.	25.6 a	134
	Wiccacon River:			
	Chinkapin Creek near Bethlehem, N.C.	R.P.	5.5 b	51.7
	Wiccacon River at mouth of Chinkapin Creek		13.2 a	
19	Wiccacon River near Harrellsville, N.C.		10.5 a	257
	Chowan River at mouth of Wiccacon River		26.8 *	
20	Chowan River near Harrellsville, N.C.		23.8 *	4589
	Bennetts Creek:			
	Duke Swamp near Sunbury, N.C.	R.P.	2.2 b	43.0
	Bennetts Creek at mouth of Duke Swamp		22.1 a	
	Bennetts Creek at Merchants Pond near Gatesville, N.C.	R.P.	17.0 a	79.6
	Chowan River at mouth of Bennetts Creek		22.4 *	
21	Chowan River near Colerain, N.C.		17.1 *	4799
22	Chowan River at Colerain Beach near Colerain, N.C.		14.6	4822
27	Chowan River near Edenton, N.C.		3.9 *	4871
	Chowan River at mouth		0.0 *	4929
	Pollock Swamp near Valhalla, N.C.	R.P.	6.2	12.2
1	Pembroke Creek near Edenton, N.C.		2.6	24.6
2	Pembroke Creek at Edenton, N.C.		0.7	28.8
	Pembroke Creek at mouth		0.0	31.2
23	Edenton Bay			
24	Edenton Bay			
25	Edenton Bay			

* - Mileage from mouth
a - Mileage from mouth of tributary
b - Mileage from mouth (tributary of a tributary)

Stage Reference

R. - Recording Gage
R.P. - Reference Point
C.G. - Chain Gage
S.G. - Staff Gage
W.G. - Wire-weight Gage



SYMBOLS:

- Industrial surface water supplies.
- Domestic sewage. Number indicates sewage population equivalent released to stream.
- Domestic sewage. Number indicates sewage population equivalent before treatment.
- Industrial waste. Number indicates sewage population equivalent released to stream.

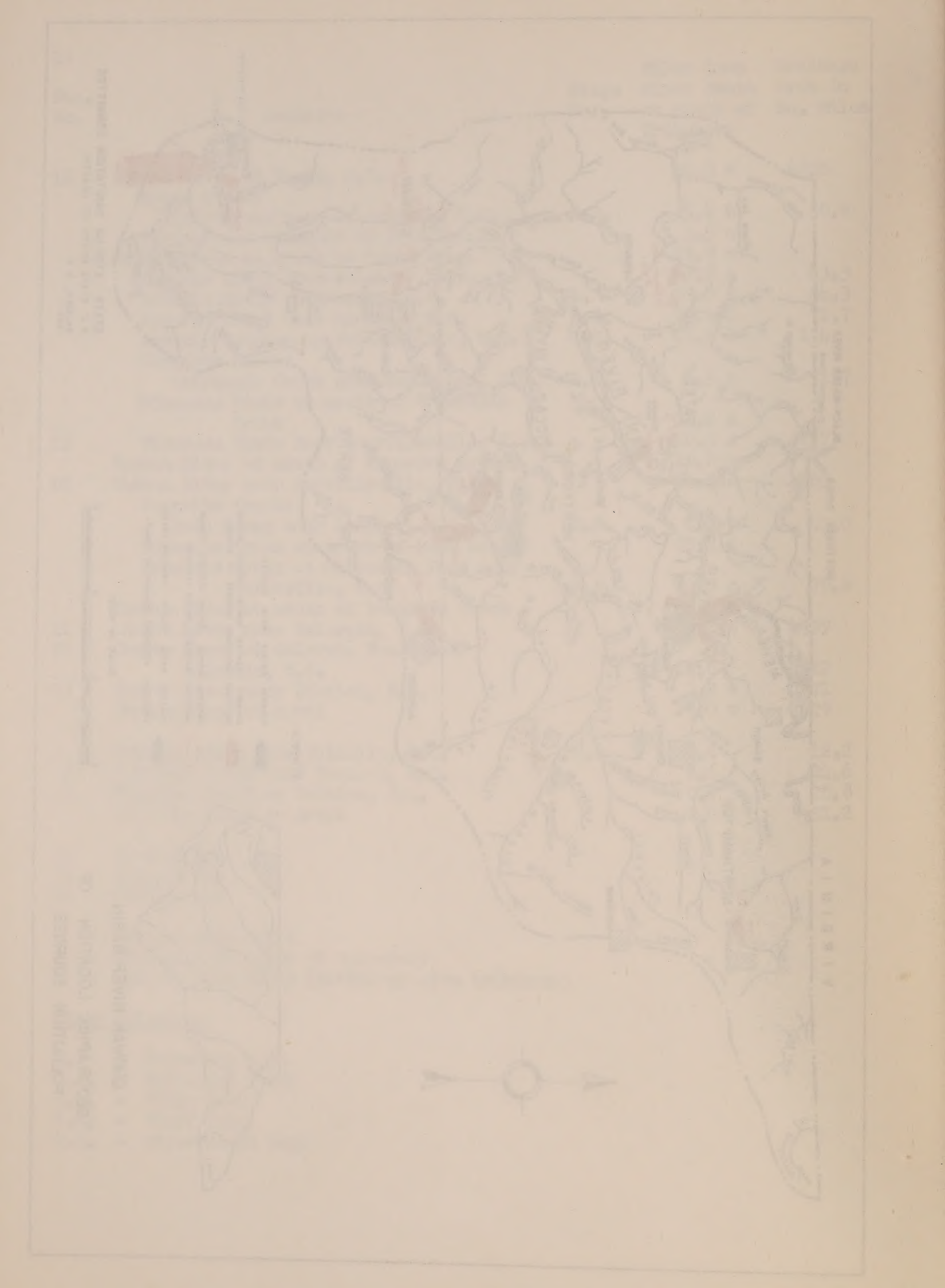
SCALE IN MILES

5 0 5 10

CHOWAN RIVER BASIN

GEOGRAPHIC LOCATION OF POLLUTION SOURCES

STATE STREAM SANITATION COMMITTEE
N. C. STATE BOARD OF HEALTH
RALEIGH, N. C.
1954



GENERAL DESCRIPTION

Historical

The Chowan River Basin was one of the first areas in North Carolina to be settled. "Edenton, settled as early as 1658, is one of the oldest communities in the state, and old records speak of it as the Customs Port of the Albemarle District. By 1710 it was the capitol of the Colony and residence of the Governor. It was known as Queen's Town, but in 1722 its name was changed to Edenton in honor of Royal Governor Charles Eden. Here was held the first Revolutionary Tea Party in 1774 in protest of the British Tax."(1) The whole area has a rich background of historical lore.

Location and Area

The Chowan River Basin lies within what is known as the Southeastern Drainage Basin Area of the United States. The Chowan Basin is bounded on the north and east in Virginia by the James River Basin, on the east in North Carolina by the Pasquotank River Basin, and on the west and south by the Roanoke River Basin. The Chowan River is formed by the confluence of the Nottoway River and the Blackwater River just below the Virginia-North Carolina State Line. It flows in a southerly direction approximately 52 miles to the west end of Albemarle Sound.

The Blackwater, Nottoway, and Meherrin Rivers all originate in Virginia and are the major tributaries draining the watershed lying within Virginia. The Chowan River forms the boundary line between Gates and Hertford Counties, and between Chowan and Bertie Counties. The Meherrin River forms part of the upper boundary between Northampton and Hertford Counties.

The Chowan Basin lies mainly in the coastal plain. Tidal effects due to wind are noticeable on the Blackwater River as far up as Franklin, Virginia.

In North Carolina there are five counties lying wholly or partially within the Chowan River Basin. The following tabulation gives these counties and the approximate area of each which lie within the Basin:

County	Total Area (Sq. Miles)	Est. Area In Basin (Sq. Miles)	Per Cent County Area Within Basin
Bertie	682	190	28%
Chowan	180	110	61%
Gates	340	262	77%
Hertford	345	345	100%
Northampton	541	355	66%
Total	2,088	1,262	

(1) Taken from N. C. Almanac 1950 - 1951

Topography

That part of the Chowan River Basin which is in North Carolina lies entirely within the coastal plain area. The highest land elevation in the Basin is 350 feet in Northampton County near Vultare. The mouth of the river where it enters Albemarle Sound is at sea level. The slope of the Meherrin River in North Carolina is less than one foot per mile. The Chowan River itself has practically no slope, it being near sea level all the way to the mouth of the Meherrin River. The only large tributary to enter the Chowan River in North Carolina is the Meherrin River with a total drainage area of 1,616 square miles, of which only 478 square miles are in North Carolina. In general, the land is quite level with fairly large portions being low and swampy.

Cover and Climate

Sixty per cent of the land is classed as forest. Pasture and cropland cover about 27 per cent of the area, while swamp and woodlands account for most of the remaining area.

The mean annual temperature of the five counties which make up the Basin is approximately 60° F., with the January average falling as low as 42° F. in some sections and the July average rising as high as 90° F. in others. The average growing season (number of days between last killing frost in the spring and the first killing frost in the fall) is between 196 and 217 days. The average annual rainfall ranges between 45 and 51 inches, with the highest monthly averages falling between June and September.

Stream Flow

Of the fifteen active gaging stations in the Chowan River Basin, only one is located in North Carolina. This station is located on Ahoskie Creek at Ahoskie and is maintained and operated by the United States Geological Survey in cooperation with the State Department of Conservation and Development.

Maximum, average, minimum, minimum daily, and minimum consecutive 7-day discharges for certain of the gaging stations throughout the Basin are given below:

Nottoway River near Sebrell, Va. - Water-stage recorder, lat. 36°46'13"; long. 77°09'59"; 2.5 miles southwest of Sebrell, Southampton County. Drainage area, 1,451 square miles. Records available September 1941 to September 1953. Maximum discharge of flood in August 1940, 48,000 cfs; average (12 years) 1,230 cfs; minimum observed, 12 cfs October 23, 1941; minimum day, 16 cfs October 23, 1941; minimum consecutive 7-day, 21.1 cfs October 17-23, 1941.

Blackwater River near Franklin, Va. - Water-stage recorder, lat. 36°45'44"; long. 76°53'55"; 6 miles north of Franklin, Southampton County. Drainage area, 613 square miles. Records available August 1944 to September 1953. Maximum discharge of period 5,360 cfs July 25, 1945; average (9 years) 591 cfs; minimum 0.4 cfs September 10, 11, 1944; minimum day, 0.4 cfs September 10, 1944; minimum consecutive 7-day 0.56 cfs August 26 to September 1, 1944; Diversion above station by City of Norfolk for municipal supply some years.

Meherrin River near Lawrenceville, Va. - Water-stage recorder, lat. 36°43'00"; long. 77°49'55"; 3 miles southeast of Lawrenceville, Brunswick County. Drainage area, 553 square miles. Records available December 1928 to September 1953. Maximum discharge during period, 38,000 cfs August 17, 1940; average (24 years) 505 cfs; minimum, 5 cfs September 23, 24, 1932; minimum day 5 cfs September 24, 1932; minimum consecutive 7-day, 6.6 cfs September 19-25, 1932.

Ahoskie Creek at Ahoskie, N. C. - Water-stage recorder, lat. 36°17'; long. 77°00'; three-quarters of a mile southwest of Ahoskie, Hertford County. Drainage area, 64.3 square miles. Records available January 1950 to September 1953. Maximum discharge during period, 904 cfs February 29, 1952; no flow at times.

Flow data for Ahoskie Creek are available through the District Office of the United States Geological Survey, Raleigh, North Carolina. Flow data for stations in Virginia are available through the District Office of the United States Geological Survey, Charlottesville, Virginia.

ECONOMIC DEVELOPMENT

Population

The estimated population in the Chowan River Basin in North Carolina in 1950 was 68,953, of which 16,968 or about 25 per cent reside in incorporated towns, while 57,985 or 75 per cent live in the rural areas. The estimated population by counties within the Chowan River Basin is as follows:

County	Total 1950 Population	Estimated Population in the Basin
Bertie	26,439	7,500
Chowan	12,540	12,500
Gates	9,555	9,500
Hertford	21,453	21,453
Northampton	28,432	18,000
Total	98,419	68,953

The 1950 population of the incorporated towns in the Chowan River Basin is listed by counties as follows:

Town	County	Population
Edenton	Chowan	4,468
Aulander	Bertie	1,112
Colerain	Bertie	367
Powellsville	Bertie	250
Gatesville	Gates	323
Ahoskie	Hertford	3,579
Harrellsville	Hertford	167
Murfreesboro	Hertford	2,140
Winton	Hertford	834
Conway	Northampton	618
Jackson	Northampton	843
Lasker	Northampton	177
Margarettsville	Northampton	113
Milwaukee	Northampton	302
Seaboard	Northampton	745
Severn	Northampton	340
Woodland	Northampton	590
Total		16,968

Industry

Commercial Fisheries

Shad and herring fisheries play an important part in the economy of the Chowan River drainage area. The processing of these fish has developed into an important industry and numerous fish canning and packing plants are located along the river and its tributaries. The alewife (herring) are the most abundant food fish inhabiting the rivers of the eastern coast of North Carolina

and they make up one-third of the total weight of all fish taken commercially in the state. In addition, white catfish is of considerable commercial importance and is an important food for many of the less prosperous families of the coastal plain area.

The following tabulation shows the volume of water products shipped from four points on the Chowan River during the calendar year ending December 31, 1953.(1)

	Fish (Pounds)
Cannons Ferry	1,810,000
Colerain	5,800,000
Edenton	1,926,000
Harris Landing (Tynches)	1,730,000
Total	11,266,000

Other Industries

There are comparatively few other industries in the area and most of them are quite small. The North Carolina Directory of Manufacturing Firms for 1952 lists a total of 106 firms for the five counties in the Basin, including those establishments located in portions of the counties that are not in the Basin. Of these over 82 per cent have less than 50 employees and only one has over 250 employees. Lumbering and wood products manufacturing (other than the making of furniture) account for 72.6 per cent of these concerns. Sixteen per cent of the firms are engaged in food processing and allied fields, leaving approximately 11 per cent to be distributed among all other types of industry. The 1950 census lists 4,834 people (4.9 per cent of the total population) engaged in manufacturing in these five counties.

Power

Due to the lack of elevation there are no hydroelectric power developments of any kind in the Chowan River Basin in North Carolina. There are, however, a few small dams that have been built to provide water power for operating small mills on some of the streams tributary to the main river.

Geology

The Chowan River Basin in North Carolina lies in the Tertiary formation. The Tertiary consists of four formations known from the oldest to the youngest as Castle Hayne, Trent, Yorktown, and Waccamaw. The Yorktown formation occupies the northern half of the Coastal Plain west of a line from Edenton to New Bern. This formation is composed mainly of sands, clays, and marl beds. The sand is fine-grained and often bluish-gray to dark bluish-green in color when fresh, but fades to a light gray or yellow on exposure to the air. Sandy marls containing an abundance of shells and shell fragments make up an important part of the formation.

(1) Data obtained from records published by the Division of Commercial Fisheries Office, North Carolina Department of Conservation and Development.

Most soils in this area are deep, and have a medium to somewhat fine texture. Silt loam surface soils and silty clay loam to clay loam subsoil textures are common because of the large areas of fine-textured geologic materials. Due to poor drainage, both surface and subsoil colors are dark. Upland bogs are composed of brown peats or black mucks which are partly due to completely decomposed plant remains.

Common brick clay has been found in the area and one brick plant is now operating. One oil well has been drilled in Hertford County without success as is the case with other wells drilled in the Coastal Plain area to date. Even though oil and gas have not been found, the thickness and character of the sedimentary beds found along the coast make the area interesting for further search.

Forest Resources

Though there are no pulp mills in the Chowan Basin, the harvesting of both pine and hardwoods is an important source of income. In 1952 the five North Carolina Counties in the Basin harvested 40,342 standard cords of pine and 4,539 cords of hardwood for a total of 44,881 cords, or almost 3.4 per cent of the total pulpwood harvested in North Carolina.

The 1945 Forest Resource appraisal of North Carolina states that 60 per cent of the land area of these counties is in forest. There are no National or Public Forests in the Basin and farm woodlands account for 51 per cent of the total forest area.

The following table taken from Bulletin No. 53 of the State Department of Conservation and Development shows the amount of lumber sawed in each of the counties in the Basin:

County	Total Forest Land - Acres	% Total Land Area in Forest	Lumber Sawed M. ft. b.m. 1942
Bertie	306,916	69%	49,055
Chowan	47,232	41%	24,246*
Gates	161,567	74%	4,115
Hertford	145,134	64%	14,636
Northampton	174,182	50%	35,356
Total	835,031		127,408

* Total for Chowan and Perquimans Counties

Agriculture

Farming is quite diversified in this region, the main crops being tobacco, peanuts, corn, and cotton. Commercial truck farming is also important. The growing of livestock is on the increase in this area. At the present time, almost twice as many cattle are being raised for beef as are being raised for milk. In 1950 the average farm in these five counties contained 82 acres and had a value of $6,905. Approximately 58 per cent of the farms were tenant operated and 60 per cent of the farms were wired for electricity. No more recent figures than 1950 are available at this time on the number of farms with

electricity but the number of all types of rural places reporting electricity in 1950 was 11,073 while as of January 1, 1954, the number was 14,475 - a gain of almost 31 per cent.

The table below lists the total value of the eleven principal crops grown in each county within the Basin. The crops considered are tobacco, cotton, peanuts, Irish potatoes, sweet potatoes, corn, wheat, oats, soybeans, lespedeza, and hay. These statistical data were taken from the 1953 issue of "North Carolina Agricultural Statistics."

Name	No. of Farms 1950	Acres Harvested 1951	Value of Products 1951
*Bertie	3,138	113,520	$15,293,590
*Chowan	798	38,980	3,983,410
*Gates	1,280	47,360	4,464,930
Hertford	1,945	73,510	10,063,450
*Northampton	3,824	148,460	15,643,430
Totals	10,985	421,830	$49,448,810

*Counties partially within the Basin.

Recreation

As would be expected, the main recreational activities are boating, swimming, fishing, and hunting. There are no National or State parks in the area. However, there is one State historical park, the James Iredell House located at Edenton. The flat swampy nature of the land gives little incentive to hiking, camping, etc., except for that done in connection with hunting and fishing. Large and small mouth bass, perch, crappie, pike, and bream are found in these waters. Quail, water fowl, wild turkey, deer, and even some bear, make hunting in this area a favorite sport.

According to information furnished by the North Carolina Wildlife Resources Commission, the value of hunting and fishing in the five counties lying wholly or partially within the Basin has been estimated at $724,645 for hunting and $521,650 for fishing. These estimates include the cost of hunting and fishing licenses as well as expenditures made by persons engaging in these activities.

Transportation

Quite naturally much of the transportation of the area originally was by water, but lately an up-to-date system of modern hard-surface roads has made access by car and truck not only possible, but a pleasure. The main north-south highways are U. S. 13, U. S. 17, and U. S. 258 with N. C. 32, N. C. 45, and N. C. 305 completing the picture. U. S. Highway #158 is the only main east-west highway, but many improved "farm-to-market" roads provide a complete system in this direction and make school bus service available to the large rural population. As of January 1, 1953, there was a total of 2,122 miles of roads in the five counties, of which 1,132 miles were hard surfaced.

The Chowan River itself can be crossed by car in only two places, U. S. 13 and U. S. 158 bridge at Winton, and U. S. 17 bridge a few miles west of

Edenton near the mouth of the river. The lower portion of the Meherrin River is crossed by a free ferry (Parker's Ferry) near its mouth, connecting roads between Winton and Chowan Beach and Como. Other crossings are provided by bridges on U. S. 258 at Murfreesboro and just below the North Carolina - Virginia State Line.

The Chowan River is navigable for its entire length of 52 miles, with a controlling depth of 12 feet to the mouth of the Meherrin River and 9 feet to the State line. The Meherrin River is navigable from its mouth to Murfreesboro, a distance of $12\frac{1}{2}$ miles, with a channel width of 100 feet and a depth of 10 feet. This river from Murfreesboro to Skinner's Landing, a distance of $8\frac{1}{2}$ miles, has a channel depth of 3 feet.

Railroad transportation in the North Carolina section of the Chowan Basin is provided by facilities of the Atlantic Coast Line, Norfolk Southern, Seaboard Air Line, and Carolina Southern Railroads. Bus transportation is available to all of the main towns in the Basin but Edenton is the only town having an airport.

THE SURVEY

General

A study was made of the water uses within the Chowan River Basin. All communities using ground water for their supply together with certain pertinent data are shown in Table 3, page 59. There are no towns using surface water supplies. To determine the significant contributors of pollution into the waters of the Basin, a systematic investigation of all sources, both municipal and industrial, was conducted. This procedure involved the determination of the volumes and characteristics of all sewage and industrial wastes, either treated or untreated, that were being discharged to the waters of the drainage basin. The points of significant pollution are shown graphically on the Map entitled, "Chowan River Basin, Geographic Location of Pollution Sources," and other pertinent data are shown in Table 4, pages 60 - 62. In addition, the survey included conferences with County Health Officials, Wildlife Protectors, Soil Conservation Officials, County Farm Agents, and others concerning the usage of the waters within the basin.

Sampling Stations and Procedures

The survey included a program of stream sampling from the North Carolina - Virginia line to the mouth of the river in Albemarle Sound and extending throughout the major tributaries in the basin with particular emphasis on those streams receiving significant pollution loads. Following the general survey of locating and determining the amounts and general characteristics of the pollution, sampling stations were established. These were located so as to have at least one a short distance above the source of pollution, and where feasible, several below the source of pollution. The location of each sampling station is shown on the Map entitled, "Chowan River Basin, Geographic Location of Sampling Stations," page 11. Table 2, pages 15 and 16, lists the location of the sampling points and gaging stations together with the miles from mouth of Chowan River, or mouth of tributary, and the drainage area above each station in square miles.

Samples were collected from the streams after the wastes had had reasonable opportunity for dilution and mixture with the receiving waters, and in such manner as would give a representative sample. The methods of sampling were varied to fit individual conditions and the types of material being sampled. Sampling operations were conducted in accordance with the procedures and methods outlined in "Standard Methods for Examination of Water and Sewage," Ninth Edition, published jointly by the American Public Health Association and the American Water Works Association. Special equipment was utilized to collect stream samples in conformity with standard procedures. Collecting devices prevented aeration of dissolved oxygen and B.O.D. samples while they were being collected. Apparatus and chemical reagents in appropriate field kits were used by the survey crews for the determination of dissolved oxygen, and water temperature. Other physical features of the stream were recorded at the time of sampling. Sampling stations were, also, established on certain streams that were known to be free of appreciable sewage and industrial pollution. The results of the samples collected from these sampling stations are important in establishing a base line of stream quality in the general area.

Hydrological Measurements

Since accurate data regarding stream flows at sampling times are essential, a co-operative program was worked out with the Raleigh Office of the United States Geological Survey. Their regularly operated stream flow measurement stations were utilized, and a network of secondary flow measurement sites was established. Within the basin there were five regular stations and nineteen sites where stage observations were obtained by manual devices. In addition, there were a number of locations where special methods were drawn upon for flow data. In general, following the selection of a sampling site, the vicinity was investigated for the location that would provide the best stage discharge relation. Then at intervals during the sampling period flow measurements were obtained to cover the range found in sampling. The cross sectional area of the stream was determined at various points, and the velocity of flow was measured by means of a current meter. From these data the stream flows were calculated.

Laboratory Tests and Their Significance

When sampling a stream, certain tests, such as temperature, pH and dissolved oxygen, together with certain observations connected with the senses of sight and smell, must of necessity be made in the field at the time of sampling. Other tests to determine pH, alkalinity, hardness, chlorides, B.O.D. and MPN and coliform bacteria were run in the mobile laboratory. Portions of the samples were packed in ice in special containers and shipped to the State Laboratory of Hygiene in Raleigh for special tests, such as suspended solids, dissolved solids, total solids, turbidity, color, ammonia nitrogen, nitrite nitrogen, nitrate nitrogen, and sulfate. The analytical results are shown in Table 5, pages 63 - 100, inclusive. Certain data as the dissolved oxygen and B.O.D. at various stations are shown on Graph 1 on pages 119 - 129 and the MPN of coliform bacteria is shown on Graph 2 on pages 131 - 141.

As a background for the presentation and discussion of laboratory data, rules and regulations have been adopted by the State Stream Sanitation Committee for use in classifying and assigning standards of quality and purity to designated waters in North Carolina. For each class of water designated there are accompanying standards of water quality and purity which shall be applied thereto. Based on the best usage, these classes for fresh surface waters are A-I, A-II, B, C, D, and E, and for tidal salt waters SA, SB, SC, and SD. Class A-I is intended to provide water which is suitable for drinking purposes with only chlorination as a means of purification. Class A-II is applicable to streams used as a source of public water supply, the quality of which must be such that they meet the Public Health Service Drinking Water Standards, and will be safe for public consumption after treatment consisting of coagulation, sedimentation, filtration, and post-chlorination. Class B is intended to provide a water of such quality that it will be suitable and safe for bathing and other recreational purposes. Class C is intended to provide a water that is suitable for the propagation of fish and wildlife. Class D is intended for waters which will be used principally in agriculture and for industrial water supply. The quality of this water will be such that it may be used for agricultural purposes without treatment, will not injure livestock, and will be satisfactory for irrigation. It will also be suitable for industrial cooling water without additional treatment, and

for industrial process water with such special treatment as may be necessary to provide a water of the quality that is required for the specific use to be made of it. Class E is a designation given to those waters, the principal use of which will be for navigation. These waters may also be used as a means of sewage and waste disposal, but not to the extent that an offensive condition will exist.

For salt or tidal waters, Class SA is intended to provide waters suitable for the culture of shellfish and the gathering of same for market purposes. Class SB is intended to provide water suitable for bathing and recreation. Class SC is intended to be suitable for the promotion of fish and wildlife culture. Class SD is for waters used for navigation and waste disposal, but not to the extent thzt an offensive condition will result.

Under certain conditions, it is necessary to make special tests for specific substances such as toxic materials, etc.; however, in the discussion which follows the requirements for stream waters for various uses are considered in terms of the usual laboratory tests that are made. As far as practical and applicable, all chemical and bacteriological examinations were made in accordance with "Standard Methods For The Examination of Water and Sewage," Ninth Edition. The routine determinations, together with a brief discussion of the significance of each are as follows:

Temperature - The temperature of stream waters is useful in indicating the solubility of gases in it and hence the saturation level of dissolved oxygen; the effect on biological activities; and the effect of viscosity on sedimentation. The level of dissolved oxygen varies inversely with the stream temperature, being lower at higher temperatures and vice versa. Temperature has a marked influence on the rates of natural purification due to biological activity, which is greater at higher temperatures up to about 140°F. and diminishes at lower temperatures. As temperature rises viscosity decreases with a resulting increase in sedimentation, provided other factors do not interfere.

Turbidity - Turbidity is measured in parts per million (ppm) of a standard suspension of diatomaceous or "Fuller's Earth." It is an index of the density of the suspended matter in a sample.

Color - The color of water is usually considered due only to substances in solution. The color of natural water is in general due to microscopic plant growths and certain soluble organic materials. Usually very intense and varied colors are produced by certain industrial wastes, such as dyes, etc. "Standard Methods" employs the platinum-cobalt method of measuring color. The unit of color in parts per million is that produced by one milligram of platinum in one liter of distilled water.

pH Value - The hydrogen-ion concentration of water expressed as pH is a measure of its acidity or alkalinity. Water having a pH value of 7.0 is considered neutral, that is, neither acid nor alkaline. Higher values indicate the presence of alkaline earth salts and lower values the presence of acid or acid salts. In North Carolina, the pH in most of the streams unaffected by sewage and industrial wastes will vary from about 6.0 to 7.5. Swamp waters and certain other natural waters may have a lower range. With respect to normal fish life in streams of the State, the pH value should be within the limits of 4.3 to 8.5.

Alkalinity - The alkalinity of natural water represents its content of carbonates, bicarbonates, hydroxides, and sometimes borates, silicates, and phosphates. It is measured by titrating with a standard acid solution to certain standard datum points or hydrogen-ion concentrations. The results are expressed as parts per million of calcium carbonate. Within normal limits, the alkalinity and hydrogen-ion concentration have little sanitary significance, but they are of value in handling industrial wastes and in controlling the various waste treatment processes.

Dissolved Oxygen - Dissolved oxygen represents the amount of oxygen dissolved in the water. This test is one of the most valuable analytical measures of the condition of a given water. When water contains as much oxygen as it can dissolve, it is saturated; when it contains less, it is undersaturated; and under certain unusual conditions it may be supersaturated. In relatively clean streams the dissolved oxygen content tends to remain at or near the saturation level. Dissolved oxygen is essential to the natural purification of stream water, and the maintenance of fish and other aquatic life. In natural streams, the dissolved oxygen is used to support the biochemical oxidation of organic wastes, but tends to be replaced by absorption from the atmosphere and the photosynthetic action of certain green plants. A deficiency in the dissolved oxygen content of a polluted stream below the saturation level indicates the presence of polluting substances, which are using up the oxygen from the stream water. The degree of this deficiency is a measure of the deoxygenating effect of the particular wastes, and hence an index of the degree of pollution present in the stream. Where a stream receives wastes at a single point, and they are rapidly mixed with the water, the dissolved oxygen content tends to follow a typical sag curve on the basis of time, temperature, oxygen demand, and the rate of reaeration in the stream. This rate of reaeration is influenced somewhat by stream temperature, but largely by the turbulence of flow which varies widely in different streams or sections of the same stream.

In streams only slightly or moderately polluted, the dissolved oxygen content usually is from 70 to 80 per cent of saturation. In grossly polluted streams the dissolved oxygen content may reach zero and remain at total depletion for a considerable length downstream. Between saturation and total depletion there are many intermediate zones which indicate various amounts of pollution. In general, the minimum oxygen requirements for streams are dependent on the usage which they must serve. With total depletion of dissolved oxygen, septic conditions occur and general nuisances follow.

In North Carolina, studies indicate that an oxygen minimum of 5.0 ppm is necessary to support trout adequately and 4.0 ppm for other forms of game fish. Fish may survive at oxygen levels of two or three parts per million; but it is considered that at least 4.0 ppm is necessary to permit the proper breeding and self-maintenance of the more desirable forms of fish.

As a general guide on the basis of stream uses and conditions the minimum dissolved oxygen requirements, in ppm, may be summarized as follows: 0.0 to 2.0 heavy pollution, probable nuisances at times, little if any fish life; 2.0 to 4.0 moderate to heavy pollution, no nuisances, fish life restricted; over 4.0 slight to moderate pollution, fish life varied, abundant and healthy.

Five-day Biochemical Oxygen Demand (B.O.D.) - The B.O.D. test is the most important made in sanitary analyses to determine the polluting power, or strength, of sewage or industrial waste. It serves as a measure of the amount of clean diluting water or degree of treatment required for the successful disposal of the polluting substance. The standard test involves the incubation of sealed samples of a stream water for 5 days at a temperature of 20°C., and the measurement of the loss of dissolved oxygen by the sample during the period of incubation. This loss represents the 5-day 20°C. B.O.D. of the sample. The B.O.D. is a measure of the amount of dissolved oxygen that may be expected to be absorbed from a stream in 5 days at 20°C. in order to satisfy the biological and chemical oxidation of the organic pollutants carried in the stream at the time of sampling. Since polluted water will continue to absorb oxygen after months of incubation, it is not practical to determine the ultimate oxygen demand of a sample.

In most cases the condition of oxidation proceeds in two stages. In the first stage, usually lasting for seven to ten days or more depending upon the particular waste, the carbonaceous matter is first oxidized, and then nitrification sets in. Organic matters found in sewage have been oxidized experimentally in this manner according to a logarithmic time function curve, which varies in its rate with the temperature of the water, the rate being increased at higher temperatures. Therefore, it is possible to calculate the approximate amount of oxygen demand satisfied at any time and at any temperature, having determined it at a standard time and temperature. The standard time and temperature usually employed in this country are 5 days at 20°C.

Usually there is a definite relationship between the dissolved oxygen content and the B.O.D. Generally, in streams below the source of pollution, it was noted that the D.O. was reduced and the B.O.D. was increased. As the natural purification processes set in downstream, the D.O. increased and the B.O.D. decreased. These changes continued, other factors being the same, until the D.O. and B.O.D. became normal, indicating that the stream had recovered from the initial pollution. In general, a stream with slight to moderate pollution will have an average B.O.D. of less than 3.0 ppm. In moderately polluted streams the B.O.D. range is usually between 3.0 and 5.0 ppm, while in grossly polluted streams the B.O.D. will be in excess of 5.0 ppm.

The Most Probable Number (MPN) of Coliform Bacteria - The coliform content is used as a general index of the sanitary condition of a stream. This determination shows the approximate density of a group of bacteria which are always present in large numbers in sewage, and are relatively few in numbers in other stream pollutants. Coliform bacteria are normal inhabitants of the intestines of all mammals, and are discharged in very large numbers in human feces, which constitutes the principal source of these bacteria in sewage. The test for coliform bacteria is made by adding various measured portions of water sample to a series of tubes containing a lactose broth liquid culture medium. After 24 to 48 hours of incubation at 37°C., tubes showing the presence of gas are considered as giving presumptive evidence of the presence of coliform bacteria, which are lactose fermenters. The amount of the original water sample tested in each series must be reduced by dilution in fixed ratios until the smallest amount gives a negative presumptive result. Since there are a few other bacteria that will cause lactose to ferment, it is

necessary to confirm the presumptive results by the respective innoculation of tubes containing brilliant green bile (B.G.B.) which is a more selective culture medium for coliform bacteria. After incubation, the presence of gas in these tubes indicates a positive result, while the absence of gas indicates a negative result. The most probable number (M.P.N.) of coliform bacteria is determined mathematically from the number of confirmed tubes giving a positive result with the different volumes or dilutions of the original water samples. Although this method is subject to a considerable error, it is the most logical and relatively precise one available for determining small densities of coliform bacteria.

The most important use of the coliform content is evaluating the water as a source of raw water for public water supplies, and its use for bathing purposes, and shellfish culture.

The recognized standards for surface waters to serve as a source of public water supply with various types of treatment are specified by the United States Public Health Service and designate the following limiting monthly arithmetical average MPN of coliforms per 100 ml.: (1) For chlorination only without any other treatment - should not exceed 50; (2) For treatment equal to coagulation, sedimentation, filtration, and post-chlorination - should not exceed 5,000 nor exceed this density in more than 20% of the samples; (3) For treatment equal to pre-chlorination, coagulation, sedimentation, filtration, and post-chlorination - should not exceed 20,000 in more than 5% of such samples; (4) Over 20,000 unfit for treatment.

There are no generally recognized standards for the classification of bathing waters with respect to their coliform content. Coliform standards have been proposed that vary from not over 50 to not over 3,000 coliforms per 100 ml. In reviewing the coliform results of various surface water samples, it is evident that the major emphasis should be placed on the sanitary survey and the proper sanitary supervision of the waters by the controlling health authorities, rather than the bacteriological content in designating areas for swimming.

The recognized bacterial quality standards for shellfish culture are specified in the "Manual of Recommended Practices for Sanitary Control of the Shellfish Industry" of the United States Public Health Service. The standards specify that the median bacteriological content of samples of water collected from shellfish growing areas shall not show the presence of organisms of the coliform group in excess of 70 per 100 ml. of water expressed in terms of most probable number (M.P.N.) in a series of samples from each station sufficient to determine the conditions existing. The manual of shellfish practices, also, recommends that bacteriological re-examinations of shellfish growing areas should be made as often as possible and whenever periodic sanitary surveys indicate that there may have been a significant increase in the quantity of sewage entering the area since the last bacteriological examinations were made.

The North Carolina State Stream Sanitation Committee, after public hearings, has established a series of classifications and water quality standards for use in classifying the waters of the State. These classifications and standards are given herein for the convenience of those concerned.

CLASSIFICATIONS AND WATER QUALITY STANDARDS

and the

RULES AND REGULATIONS

RELATING TO CLASSIFYING AND ASSIGNING WATER QUALITY STANDARDS

to the

WATERS OF NORTH CAROLINA

REGULATION NO. I

The State Stream Sanitation Committee, prior to classifying and assigning standards of water quality to any specifically designated waters of the State, will proceed as follows:

1. The Committee will designate and define the specific limits of each separate major watershed within the State to be studied for the purpose of classifying and assigning water quality standards to the waters or segments of waters therein.

2. The Committee will direct its Executive Secretary to have studies made of the designated waters to obtain the essential data and facts required for consideration in determing the proper classification of such waters or segments of waters under consideration.

3. The Committee will direct its Executive Secretary to have a report of the findings of such studies prepared and distributed or otherwise made available so far as practicable to all parties having specific interests in the classification of the designated waters. Such report shall contain recommendations as to classification of such waters or segments thereof, together with the standards of water quality which apply to the various classifications recommended.

4. The Chairman of the Committee, or the Committee as a whole, will designate one or more of its members as Hearing Examiner or Examiners to conduct a public hearing on the matter of classifying and assigning standards of water quality to the waters under consideration and will specify the date, time and place for holding each such public hearing.

5. The Executive Secretary will give due notice of such hearing or hearings in accordance with the requirements of Section 143-215, Article 21 of the General Statutes of North Carolina.

6. The Hearing Examiner or Examiners will, as soon as practicable after the completion of the hearing, submit a complete report of the proceedings of the hearing, together with recommendations to the Committee for disposition of the matter under consideration. The report shall be accompanied by a transcript of testimony presented at such public hearing, together with exhibits, a summary of relevant information from and results of stream studies conducted by the technical staff of the Committee, and final recommendations as to classification of the designated waters or segments thereof and the standards of water quality which should be applied to each classification recommended.

7. The Committee, after due consideration of the hearing records and the final recommendations of the Hearing Examiner or Examiners, will adopt its final action with respect to the assignment of classifications applicable to the identified waters under consideration and will publish such action, together with the effective date for the application of the provisions of Section 143-215.1 and 143-215.2 of Article 21, General Statutes of North Carolina, as a part of the Committee's official regulations. Such effective date shall not be less than 60 days from the date of such publications.

8. The final action of the Committee with respect to the assignment of classification with its accompanying standard shall contain the Committee's conclusions relative to the various factors given in paragraph (d) of Section 143-215 of Article 21, and shall specifically state:

(1) The best usage in the interest of the public for such specifically identified waters or segments thereof, in accordance with the provisions of the Statute.

(2) The class or classes to which such specifically designated waters in the watershed or watersheds shall be assigned.

(3) The standards of water quality which shall be assigned to each classification to which the specifically identified waters or segments thereof are assigned.

REGULATION NO. II

The Series of Classifications and the Water Quality Standards applicable to each such classification, which are attached hereto and made a part hereof, will be used by the Committee for the purpose of assigning an appropriate classification to each separately identified water or segment thereof which the Committee believes to be of sufficient importance to justify classification or control. The standards of water quality for each separately identified water for which classification is assigned shall be those specified for such classification in the attached Series of Classifications and the Water Quality Standards. In determining the best usage and in assigning such classifications, the Committee will consider the criteria specified in Section 143-215 (d) of the General Statutes of North Carolina.

CLASSIFICATIONS AND WATER QUALITY STANDARDS FOR NORTH CAROLINA

S E C T I O N I

DEFINITIONS

The definition of any word and phrase used in Section II, III, or IV shall be the same as given in Section 143-212, Article 21 of the General Statutes of North Carolina. The following words and phrases, which are not defined in said section, shall be construed to have the following meanings:

1. Source of water supply for drinking, culinary or food-processing purposes shall mean any source, either public or private, the waters

from which are used for human consumption, or used in connection with the processing of milk, beverages, food or for other purposes which require water meeting the "Public Health Service Drinking Water Standards."

2. Approved treatment, as applied to water supplies, means treatment accepted as satisfactory by the health authorities responsible for exercising supervision over the sanitary quality of water supplies.

3. Bathing shall include swimming, diving, wading, and similar uses but shall be regarded as a best usage only for waters in which such uses are or may be expected to be subjected to effective sanitary supervision and control.

4. Fishing shall include the propagation of fish and such other aquatic life as is necessary to provide a suitable environment for fish.

5. Shellfish culture shall include the use of waters for the propagation, storage and gathering of oysters, clams and other shellfish for market purposes.

6. Agricultural shall include the use of waters for stock watering, irrigation, and other farm purposes but not as sources of water supply for drinking, culinary or food-processing purposes.

7. Waste disposal shall include the use of waters for the disposal of sewage, industrial waste or other waste either before or after treatment.

8. Tidal salt waters shall mean all tidal waters which are so designated by the State Stream Sanitation Committee and which generally have a natural chloride ion content in excess of 500 parts per million.

9. Swamp waters shall mean those waters which are so designated by the State Stream Sanitation Committee and which are topographically located so as to generally have very low velocities and certain other characteristics which are different from adjacent streams draining steeper topography.

10. Offensive condition shall be construed to mean and include any condition or conditions resulting from the presence of sewage, industrial wastes or other wastes within the waters of the State or along the shorelines thereof which shall either directly or indirectly cause foul or noxious odors, unsightly conditions, the breeding of abnormally large quantities of mosquitoes or other insect pests, or shall damage private or public water supplies or other structures, result in the development of gases which destroy or damage surrounding property, herbage or grasses, or which shall affect the health of any person residing or working in the area.

11. Best usage of waters as specified for each class shall be those uses as determined by the State Stream Sanitation Committee in accordance with the stipulations in Article 21, General Statutes of North Carolina.

S E C T I O N II

RULES APPLICABLE TO CLASSES AND STANDARDS

1. In cases where sewage, industrial wastes or other wastes are discharged directly into waters which are assigned a different classification than the waters into which such receiving waters flow, the standards applicable to the waters which receive such sewage, industrial wastes or other wastes shall be supplemented by the following:

> "The quality of any waters receiving sewage, industrial wastes or other waste discharges shall be such that no impairment of the best usage of waters in any other class shall occur by reason of such sewage, industrial wastes or other waste discharges."

2. Tests or analytical procedures to determine conformity or non-conformity with standards will, insofar as practicable and applicable, be made in accordance with the methods given in the latest edition of "Standard Methods for the Examination of Water and Sewage", published by the American Public Health Association, or, where other tests or analytical procedures have been found to be more applicable and satisfactory, same may be used upon acceptance and approval by the Committee.

3. In making tests or analytical determinations of classified waters to determine conformity or non-conformity with the established standards, samples shall be collected in such manner and at such locations as approved by the Executive Secretary of the Committee as being representative of the receiving waters after reasonable opportunity for dilution and mixture with the waste discharged thereto. When, in the opinion of the Executive Secretary it becomes necessary or desirable, samples will be collected from sewage and industrial waste outfalls and discharges from such outfalls will be metered or otherwise measured to determine the volume of flow.

4. Natural waters may on occasion have characteristics outside of the limits established by the standards. The standards adopted herein relate to the condition of waters as affected by the discharge of sewage, industrial wastes or other wastes.

S E C T I O N III

ESTABLISHED CLASSES FOR FRESH SURFACE WATERS AND THE STANDARDS OF WATER QUALITY AND PURITY WHICH SHALL BE APPLIED THERETO.

CLASS A-I

Best Usage of Waters: Source of water supply for drinking, culinary, or food-processing purposes or any other usage requiring waters of lower quality.

Conditions Related to Best Usage: This class is intended primarily for waters having watersheds which are uninhabited and otherwise protected as required by the State Board of Health and which require only approved disinfection, with additional treatment when necessary to remove naturally present impurities, in order to meet the "Public Health Service Drinking Water Standards" and will be considered safe for drinking, culinary, and food-processing purposes.

Quality Standards for Class A-I Waters

Items	Specifications
1. Floating solids; settleable solids; sludge deposits; tastes or odor-producing substances.	None attributable to sewage, industrial wastes or other wastes.
2. Sewage, industrial wastes or other wastes.	None
3. Toxic wastes; oils; deleterious substances; colored or other wastes.	None

Note No. 1: In determining the safety or suitability of waters in this class for use as a source of water supply for drinking, culinary or food-processing purposes after approved disinfection, the Committee will be guided by the physical, chemical and bacteriological standards specified in the latest edition of the "Public Health Service Drinking Water Standards" and the requirements of the State Board of Health as set forth in the "Rules Relating to the Protection of Unfiltered Public Water Supplies."

CLASS A-II

Best Usage of Waters: Source of water supply for drinking, culinary or food-processing purposes and any other best usage requiring waters of lower quality.

Conditions Related to Best Usage: The waters, if subjected to approved treatment equal to coagulation, sedimentation, filtration and disinfection, with additional treatment if necessary to remove naturally present impurities, will meet the "Public Health Service Drinking Water Standards" and will be considered safe for drinking, culinary or food-processing purposes.

Quality Standards for Class A-II Waters

Items	Specifications
1. Floating solids; settleable solids; sludge deposits.	Only such amounts attributable to sewage, industrial wastes or other wastes as will not, after reasonable opportunity for dilution and mixture of same with the receiving waters, make the waters unsafe or unsuitable as a source of water supply for drinking, culinary, or food-processing purposes, injurious to fish and wildlife, or impair the waters for any other best usage established for this class.

2. Sewage, industrial wastes or other wastes.	None which are not effectively treated to the satisfaction of the Committee and in accordance with the requirements of the State Board of Health.
3. Odor-producing substances contained in sewage, industrial wastes or other wastes.	Only such amounts, whether alone or in combination with other substances or wastes, as will not, after reasonable opportunity for dilution and mixture of same with the receiving waters, cause taste and odor difficulties in water supplies which cannot be corrected by treatment as specified under "Conditions Related to Best Usage", impair the palatability of fish, or have a deleterious effect upon any best usage established for waters of this class.
4. Phenolic compounds.	Not greater than 3.0 parts per billion (phenols).
5. pH	Shall be normal for the waters in the area, which generally shall range between 6.0 and 8.5, except that swamp waters may have a low of 4.3.
6. Total hardness.	Not greater than 100 parts per million as $CaCO_3$.
7. Dissolved oxygen.	Not less than 5.0 parts per million for trout producing waters; not less than 4.0 parts per million for non-trout waters, except that swamp waters may have a minimum of 3.0 parts per million.
8. Toxic wastes; oils; deleterious substances; colored or other wastes; or heated liquids.	Only such amounts, whether alone or in combination with other substances or wastes, and only such temperatures as will not render the waters unsafe or unsuitable as a source of water supply for drinking, culinary, or food-processing purposes, injurious to fish and wildlife or adversely affect the palatability of same, or impair the waters for any other best usage established for this class.

Note No. 1: In determining the safety or suitability of waters in this class for use as a source of water supply for drinking, culinary or food-processing purposes after approved treatment, the Committee will be guided by the physical, chemical and bacteriological standards specified in the latest edition of the "Public Health Service Drinking Water Standards."

Note No. 2: It is recognized that certain toxic substances will seriously affect fish life; however, the establishment of a single numerical standard for North Carolina waters would be too restrictive. In view of this and since there are many waters which, because of poor buffering capacity and composition will require special consideration, limiting values for such toxic materials will be established on the basis of the characteristics of the particular waters under consideration.

CLASS B

Best Usage of Waters: Bathing and any other usage except as source of water supply for drinking, culinary or food-processing purposes.

Conditions Related to Best Usage: The waters, under proper sanitary supervision by the controlling health authorities, will meet accepted standards of water quality for outdoor bathing places and will be considered safe and satisfactory for bathing purposes. Also, suitable for other uses requiring waters of lower quality.

Quality Standards for Class B Waters

Items	Specifications
1. Floating solids; settleable solids; sludge deposits.	Only such amounts attributable to sewage, industrial wastes or other wastes as will not, after reasonable opportunity for dilution and mixture of same with the receiving waters, make the waters unsafe or unsuitable for bathing, injurious to fish and wildlife, or impair the waters for any other best usage established for this class.
2. Sewage, industrial wastes or other wastes.	None which are not effectively treated to the satisfaction of the Committee. In determining the degree of treatment required for such waste when discharged into waters to be used for bathing, the Committee will take into consideration the quantity and quality of the sewage and wastes involved and the proximity of such discharges to the waters in this class.
3. Phenolic compounds.	Not to exceed 3.0 parts per billion (phenols).
4. pH	Shall be normal for the waters in the area, which generally shall range between 6.0 and 8.5, except that swamp waters may have a low of 4.3.

5. Dissolved oxygen.	Not less than 5.0 parts per million for trout producing waters; not less than 4.0 parts per million for non-trout waters, except that swamp waters may have a minimum of 3.0 parts per million.
6. Toxic wastes; oils; deleterious substances; colored or other wastes; or heated liquids.	Only such amounts, whether alone or in combination with other substances or wastes, and only such temperatures as will not render the waters unsafe or unsuitable for bathing, injurious to fish and wildlife or adversely affect the palatability of same, or impair the waters for any other best usage established for this class.

Note No. 1: Refer to Note No. 2 under Class A-II which also applies to Class B standards.

Note No. 2: In assigning this classification to waters intended for bathing, the Committee will take into consideration the relative proximity of sources of pollution and will recognize the potential hazards involved in locating swimming areas close to sources of pollution and will not assign this classification to waters, the bacterial quality of which is dependent solely upon adequate disinfection, and where the interruption of such treatment would render the water unsafe for bathing.

CLASS C

Best Usage of Waters: Fishing and any other usage except for bathing or as a source of water supply for drinking, culinary or food-processing purposes.

Conditions Related to Best Usage: The waters will be suitable for fish and wildlife propagation. Also suitable for other uses requiring waters of lower quality.

Quality Standards for Class C Waters

Items	Specifications
1. Floating solids; settleable solids; sludge deposits.	Only such amounts attributable to sewage, industrial wastes or other wastes as will not, after reasonable opportunity for dilution and mixture of same with the receiving waters, make the waters unsafe or unsuitable for fish and wildlife, or impair the waters for any other best usage established for this class.
2. pH	Shall be normal for the waters in the area, which generally shall range between 6.0 and 8.5, except that swamp waters may have a low of 4.3.

3. Dissolved oxygen.	Not less than 5.0 parts per million for trout producing waters; not less than 4.0 parts per million for non-trout waters, except that swamp waters may have a minimum of 3.0 parts per million.
4. Toxic wastes; oils; deleterious substances; colored or other wastes; or heated liquids.	Only such amounts, whether alone or in combination with other substances or wastes, and only such temperatures as will not render the waters injurious to fish and wildlife or adversely affect the palatability of same, or impair the waters for any other best usage established for this class.

Note No. 1: Refer to Note No. 2 under Class A-II which is also applicable to Class C Standards.

CLASS D

Best Usage of Waters: Agriculture, industrial cooling and process water supply, fish survival and any other usage, except fishing, bathing or as source of water supply for drinking, culinary or food-processing purposes.

Conditions Related to Best Usage: The waters without treatment and except for natural impurities which may be present therein will be suitable for agricultural uses and will permit fish survival. The waters will also be usable after special treatment by the user as may be needed under each particular circumstance for industrial purposes, including cooling and process waters.

Quality Standards for Class D Waters

Items	Specifications
1. Floating Solids; settleable solids; sludge deposits.	Only such amounts attributable to sewage, industrial wastes or other wastes as will not, after reasonable opportunity for dilution and mixture of same with the receiving waters, render the waters unsuitable for agriculture, industrial cooling purposes and fish survival.
2. pH	Shall be normal for the waters in the area, which generally shall range between 6.0 and 8.5, except that swamp waters may have a low of 4.3.
3. Dissolved oxygen.	Not less than 3.0 parts per million.
4. Toxic wastes; oils; deleterious substances; colored or other wastes or heated liquids.	Only such amounts attributable to sewage, industrial wastes or other wastes and only such temperatures as will not render the waters unsuitable for agriculture, industrial cooling purposes and fish survival.

Note No. 1: Refer to Note No. 2 under Class A-II which is also applicable to Class D Standards.

CLASS E

Best Usage of Waters: Navigation and disposal of sewage, industrial wastes, or other wastes, and any other uses except agriculture, source of industrial cooling waters, fishing, bathing, or source of water supply for drinking, culinary or food-processing purposes.

Conditions Related to Best Usage: Waters will be suitable for navigation where navigable waters are involved, and may be used for waste disposal to the extent that the stream will accommodate same within the limits of the prescribed specifications for this class. This class will not be assigned to waters which can, in the light of consideration prescribed by the Statutes, be properly assigned to a higher class.

Quality Standards for Class E Waters

Items	Specifications
1. Floating solids; settleable solids; oils; sludge deposits.	Only such amounts attributable to sewage, industrial wastes or other wastes as will not interfere with navigation in navigable waters, and will not create an offensive condition in waters, whether or not navigable.
2. pH	Not lower than 4.3 in waters used for navigation. Otherwise, it shall be maintained at such levels as not to adversely affect the quality of waters in any other class to which these waters may be tributary.
3. Dissolved oxygen.	Sufficient to prevent the development of an offensive condition.
4. Odor-producing substances.	Only such amounts as will not create an offensive condition.

S E C T I O N IV

ESTABLISHED CLASSES FOR TIDAL SALT WATERS AND THE STANDARDS OF WATER QUALITY AND PURITY WHICH SHALL BE APPLIED THERETO.

CLASS SA

Best Usage of Waters: Shellfishing for market purposes and any other usage requiring waters of lower quality.

Conditions Related to Best Usage: Waters will meet the sanitary and bacteriological standards given in the latest edition of "Manual of Recommended Practices for Sanitary Control of the Shellfish Industry," recommended by the Public Health Service and will be considered safe and suitable for shellfish culture.

Quality Standards for Class SA Waters

Items	Specifications
1. Floating solids; settleable solids; sludge deposits.	None attributable to sewage, industrial wastes or other wastes.
2. Sewage, industrial wastes or other wastes.	None which are not effectively treated to the satisfaction of the Committee and in accordance with the requirements of the State Board of Health.
3. pH.	Range between 6.8 and 8.5.
4. Dissolved oxygen.	Not less than 4.0 parts per million, except that swamp waters may have a minimum of 3.0 parts per million.
5. Toxic wastes; oils; deleterious substances; colored or other wastes or heated liquids.	Only such amounts, whether alone or in combination with other substances or wastes, and only such temperatures as will not make the waters unsafe or unsuitable for fish and shellfish or their propagation, impair the palatability of same, or impair the waters for any other best usage established for this class.
6. Organisms of coliform group.	The coliform bacterial content of the water shall not exceed the limits specified in the latest edition of "Manual of Recommended Practices for Sanitary Control of the Shellfish Industry," recommended by the Public Health Service.

Note No. 1: Refer to Note No. 2 under Class A-II, which will also apply to Class SA Standards.

CLASS SB

Best Usage of Waters: Bathing and any other usage except shellfishing for market purposes.

Conditions Related to Best Usage: The waters, under proper sanitary supervision by the controlling health authorities, will meet accepted sanitary standards of water quality for outdoor bathing places and will be considered safe and satisfactory for bathing purposes.

Quality Standards for Class SB Waters

Items	Specifications
1. Floating solids; settleable solids; sludge deposits.	None attributable to sewage, industrial wastes or other wastes.

2. Sewage, industrial wastes, or other wastes.	None which are/not effectively treated to the satisfaction of the Committee. In determining the degree of treatment required for such wastes when discharged into waters to be used for bathing, the Committee will take into consideration the quantity and quality of the sewage and wastes involved and the proximity of such discharges to the waters in this class.
3. pH	Shall be normal for the waters in the area, which generally shall range between 6.0 and 8.5, except that swamp waters may have a low of 4.3.
4. Dissolved oxygen.	Not less than 4.0 parts per million, except that swamp waters may have a minimum of 3.0 parts per million.
5. Toxic wastes; oils; deleterious substances; colored or other wastes; or heated liquids.	Only such amounts, whether alone or in combination with other substances or wastes, and only such temperatures as will not make the waters unsafe or unsuitable for bathing, injurious to fish or shellfish, or adversely affect the palatability of same, or impair the waters for any other best usage established for this class.

Note No. 1: In assigning waters to this class, the Committee will take into consideration the proximity of points of sewage, industrial waste and other waste discharges and will recognize the potential hazards involved in locating bathing areas close to sources of pollution. Waters will not be assigned to this class if the bacterial quality of these waters is solely dependent upon adequate disinfection and where the interruption of such treatment would render the waters unsafe for bathing purposes.

Note No. 2: Refer to Note No. 2 under Class A-II, which will also apply to Class SB Standards.

CLASS SC

Best Usage of Waters: Fishing, and any other usage except bathing or shellfishing for market purposes.

Conditions Related to Best Usage: The waters will be suitable for fishing and fish propagation. Also suitable for other uses requiring waters of lower quality.

Quality Standards for Class SC Waters

Items	Specifications
1. Floating solids; settleable solids; sludge deposits.	Only such amounts attributable to sewage, industrial wastes or other wastes as will not, after reasonable opportunity for dilution and mixture of same with the receiving waters, make the waters unsafe or unsuitable for fish, shellfish and wildlife, or impair the waters for any other best usage established for this class.
2. pH.	Shall be normal for the waters in the area, which generally shall range between 6.0 and 8.5, except that swamp waters may have a minimum of 4.3.
3. Dissolved oxygen.	Not less than 4.0 parts per million, except that swamp waters may have a minimum of 3.0 parts per million.
4. Toxic wastes; oils; deleterious substances; colored or other wastes; or heated liquids.	Only such amounts, whether alone or in combination with other substances or wastes, and only such temperatures as will not render the waters injurious to fish and shellfish, adversely affect the palatability of same, or impair the waters for any other best usage established for this class.

Note No. 1: Refer to Note No. 2 under Class A-II which will also apply to Class SC Standards.

CLASS SD

Best Usage of Waters: Navigation and any other best usage, except fishing, bathing, or shellfishing for market purposes.

Conditions Related to Best Usage: Waters will be suitable for navigation, and in certain instances where there is either no practical means of treatment known or where the degree of treatment required to satisfy the standards for a higher class is economically impractical, these waters may be used for the disposal of sewage, industrial wastes or other wastes until feasible treatment processes become available, but in no instance shall any such usage result in the development of an offensive condition.

Quality Standards for Class SD Waters

Items	Specifications
1. Floating solids; settleable solids; sludge deposits.	Only such amounts attributable to sewage, industrial wastes or other wastes as will not interfere with navigation, or cause an offensive condition.
2. pH.	Not lower than 4.3 in waters used for navigation. Otherwise, it shall be maintained at such levels as not to adversely affect the quality of waters in any other class to which these waters may be tributary.
3. Dissolved oxygen.	Sufficient to prevent the development of an offensive condition.
4. Toxic wastes; oils; deleterious substances; colored or other wastes.	Only such amounts, whether alone or in combination with other substances or wastes and only such temperatures as will not render the waters unsuitable for navigation, or create an offensive condition.

GENERAL SURVEY FINDINGS

In order to simplify the presentation of the survey findings, the Basin has been divided into four sections. Significant land and water uses are discussed for each section and specific factual data relative to major sources of pollution and their effects are analyzed. Additional data are given in Table No. 3, "Public Ground Water Supplies," page 59; and Table No. 4, "Points of Significant Pollution," pages 60 - 62.

SECTION I

MAIN STREAM AND TRIBUTARIES FROM N. C. - VIRGINIA STATE LINE TO MOUTH OF MEHERRIN RIVER

Land Characteristics and Uses

This area of the watershed has the highest elevation in the Basin. The highest point in the vicinity of Vultare is 326 feet above sea level. In general, the area is level and gently rolling, with the rolling areas being interspersed with many swamps. Most streams are just a few feet above sea level, but the Chowan River lies near sea level. Practically all of the streams have relatively wide overflow bottoms. Drainage is mainly poor in the level to gently undulating areas, and good in the more rolling areas.

There is considerable farming done in this section. One of the largest peanut growing areas in the State is located here. Other important crops are corn, cotton, and tobacco.

A large portion of the area is covered with trees. The principal industry outside of agriculture is lumbering. Many small mills operate throughout the region. Main wood products are pilings, veneer, shingles, and flooring.

Because of the coverage given by the woodland, this area is a natural habitat for wildlife. As would be expected, hunting and camping activities are quite extensive in this area. There is good deer and bear hunting in this section. Some quail, waterfoul, and wild turkey are found along the banks of the Chowan River.

Existing Stream Uses

All towns and communities in this area obtain their domestic water supplies from wells. One industry, Riverside Manufacturing Company, located at Murfreesboro, obtains water from the Meherrin River for industrial use.

Both commercial and sport fishing are prevalent in most of the larger streams in the area. Commercial fishing is confined mainly to the main stem of the Chowan River, and to the annual herring run in the spring of the year. Other fish, such as large and small mouth bass, pike, perch, bream, and crappie are available in most of the streams and are taken by the sport fishermen.

The streams in this portion of the Chowan River Basin are used to some extent for sewage and waste disposal. The various significant sources of pollution are as follows:

Pollution Reaching Chowan River Basin from Virginia - The Chowan River is formed by the confluence of the Nottoway and Blackwater Rivers in the vicinity of North Carolina - Virginia State Line. The Meherrin River, the only large tributary to enter the Chowan River in North Carolina, originates and has a major portion of its drainage area in Virginia. These three major tributaries are receiving streams for wastes that originate in Virginia. Significant sources of pollution in Virginia whose wastes are discharged to the Chowan River tributaries are discussed below:

Blackwater River - Communities in Virginia that contribute domestic waste to this tributary are Franklin, Wakefield, and Waverly. Manufacturing concerns that contribute industrial wastes are Camp Manufacturing Company (Pulp and Paper) located at Franklin; and Pocahontas Poultry Farm located at Wakefield. These communities and industries discharge wastes to Blackwater River which are estimated to have a total B.O.D. loading equivalent to raw sewage from a domestic population of 96,000 people.

Nottoway River - Sources in Virginia that contribute domestic wastes to this tributary are Jarrett, McKenny, Piedmont Sanatorium, Southampton Farms (Penitentiary), and Victoria. Johns Manville Products Corporation, (Building Board), located at Jarrett, is the only major source of industrial wastes. The combined wastes from these sources are estimated to have a total B.O.D. loading to the Nottoway River equivalent to domestic sewage from a population of 9,000 people.

Meherrin River - Communities in Virginia that contribute domestic wastes to this tributary are Boykin, Emporia, Holland, Kenbridge, Lawrenceville, and Saint Paul's Polytechnic Institute. The only contributor of industrial wastes is the Virginia Dyeing Corporation, which is a textile industry located at Emporia. Total waste loadings to Meherrin River from these sources are estimated to have a B.O.D. loading equivalent to raw sewage from a domestic population of 25,000 people.

The above mentioned municipalities and manufacturing establishments discharging waste materials, (both treated and untreated), are located above the North Carolina - Virginia State Line ranging from 16 to 58 miles for the Blackwater River; from 57 to 123 miles for the Nottoway River; and from 4 to 87 miles for the Meherrin River. It is obvious, therefore, that the total pollutional load to the streams in Virginia from these sources, (P.E. of 96,000 people to Blackwater River; P.E. of 9,000 people to Nottoway River; and P.E. of 25,000 people to Meherrin River), is materially reduced by the natural purification processes which take place in the stream between the points of waste discharged and the North Carolina State Line. Sampling Stations 7, 8, and 11 located on the Blackwater, Nottoway, and Meherrin Rivers above the State line indicate stream loadings reaching North Carolina of 3,990, 3,020, and 1,500 pounds per day, 5-day B.O.D. @ 25° C., respectfully. Data with reference to samples collected and analyzed at the three sampling stations referred to are given in Table 5 on pages 69, 70, and 73.

Town of Seaboard - The public sewerage system serves 704 people and discharges the effluent from its primary treatment plant into Ivy Creek. The plant effluent has a P.E. of 493 people and is significant only from the standpoint of local pollution in the receiving stream below the point of discharge.

Kirby Chemical Co. near Severn - This industry discharges approximately 250 gallons of waste per day, containing 25 per cent of sodium sulfate, to a natural lagoon located adjacent to Meherrin River. This lagoon has no outlet to the stream. However, there is a possibility of pollution to the stream resulting from seepage or from washouts due to flood waters. There is also a possibility of pollution to the stream as a result of overflow or spillage during plant operation.

Riverside Manufacturing Co. at Murfreesboro discharges to Meherrin River untreated domestic sewage having an estimated P.E. of 142 and industrial wastes having an estimated P.E. of 396. Total volume of wastes amounts to about 12,000 gallons per day. In addition, this company draws on Meherrin River for its boiler water supply using about 22,000 gallons per day. These wastes cause a marked increase in the coliform bacterial content of the stream.

Town of Murfreesboro - The public sewerage system receives domestic waste from an estimated population of 1,800 people and industrial waste from a laundry having an estimated P.E. of 500 people. These wastes, having a total P.E. of 2,300 people, are discharged by means of two outfalls direct to Meherrin River without Treatment. Stream studies conducted on the Meherrin River in the vicinity of Murfreesboro indicate that wastes from the Town of Murfreesboro result in excessive pollution of Meherrin River and are a potential hazard from the standpoint of development of local nuisance conditions. The Town of Murfreesboro should provide adequate waste treatment facilities.

J. M. Brown and Son near Woodland discharges a small amount of industrial waste into a small drainage ditch which flows into Urahaw Swamp. This waste amounts to about 4,000 gallons per day and has an estimated P.E. of 216. The effects of this waste are limited to local pollution in the small receiving stream.

Milwaukee Basket Company at Milwaukee discharges a small amount of industrial waste into a small drainage ditch which flows to Potecasi Creek. This waste amounts to about 5,000 gallons per day and has an estimated P.E. of 252. The effects of this waste are limited to local pollution in the small receiving stream.

Town of Woodland - This town had a 1950 population of 590 people and has no municipal sewer system. Plans are now underway for the construction of a sewage collection system and adequate treatment facilities.

Talon, Inc. at Woodland - This manufacturing establishment has no industrial waste but employs 185 people that have an estimated domestic sewage flow of 4,000 gallons per day. Waste is being treated by a septic tank plus a filter trench with the effluent discharging a small amount of sewage to a drainage ditch that flows to Urahaw Swamp. The pollution is significant only from the standpoint of local pollution below the point of discharge.

Potential Future Development of Area

This area has possibilities of further agricultural and some industrial development. The waters should in general be protected for fish and wildlife,

agriculture, and recreational uses such as hunting and camping. Increased use of water for irrigation is a possibility.

SECTION II

MAIN STEM AND TRIBUTARIES FROM MOUTH OF MEHERRIN RIVER TO ATLANTIC COAST LINE RAILROAD CHOWAN RIVER BRIDGE AT TUNIS

Land Characteristics and Uses

This area of the watershed is divided into two distinct regions. The area in Gates County adjacent to the main stem is composed entirely of swamp land at sea level elevation, while the area in Hertford County has elevations ranging from sea level to 40 feet. Drainage is poor in the low, swampy areas, to good in areas of higher elevations. In most cases, the low areas are affected by wind tides on the Chowan River.

There is some farming being done in the area west of the main stem. The cash crops are peanuts, cotton, and tobacco. There is little industry other than lumbering.

Existing Stream Uses

The Town of Winton is the only community located in this area, and provides the only significant source of pollution. The Town obtains its water supply from wells. In addition, it has primary treatment plant that serves an estimated population of 604 and discharges an effluent having a P.E. of 454 to the Chowan River. The conditions observed both at the plant and in the stream below the effluent indicate that the plant is not being properly operated or maintained.

The most important use of the waters in this area is recreational. Fishing, especially sport fishing, is widespread throughout the area. Fish normally caught in these waters are the large mouth bass, perch, and herring in the spring of the year.

Two organized bathing areas, Tuscarora and Chowan Beaches, are located in this area. In order to determine the water quality for these bathing areas, bacteriological sampling was conducted at several selected points in and near each beach. Coliform M.P.N. values obtained for each of these points during sampling may be seen in maps entitled, "Map of Tuscarora Beach Showing Coliform Sampling Points and M.P.N. Values" on page 115, and "Map of Chowan Beach Showing Coliform Sampling Points and M.P.N. Values" on page 117. Each of these beaches is discussed as follows:

Tuscarora Beach - This beach is located on the west bank of the Chowan River downstream from Winton. Recreational facilities include bathing, boating, and dancing. Stream studies indicate that this beach is being polluted by waste from Winton. It appears that additional treatment of waste must be provided by the Town of Winton if this area is continued to be used for bathing.

Chowan Beach - This beach is operated for negroes with recreational facilities for bathing, boating, and dancing. This beach is located on the west bank of Chowan River approximately 1.4 miles below the confluence of Meherrin River with the main stem. Stream studies indicate that this beach is not polluted; however, at times, the beach may be affected by waste in Chowan River from Virginia and by waste in Meherrin River from the Town of Murfreesboro.

Potential Future Development of Area

This area has possibilities of further agricultural development and some industrial growth as pertaining to the lumbering and fishing industries. If the waters in this area are protected from pollution, Chowan River can be further developed for recreational activities.

SECTION III

MAIN STEM AND TRIBUTARIES FROM ATLANTIC COAST LINE RAILROAD CHOWAN RIVER BRIDGE AT TUNIS TO MOUTH WITH EXCEPTION OF BATHING AREAS

Land Characteristics and Uses

This area of the watershed has the longest segment of the main stem. Chowan River has a total length of approximately 52 miles in North Carolina, with approximately 35 miles of it lying within this area. Four of the five counties in the basin are adjacent to the main stem, but segments of all counties are included in this area.

As reported for Section II, this area has two distinct regions. The lands bordering the main stem in Gates and Hertford counties located in the northern part of this section are almost entirely in swampland. In most cases, the area is affected by wind tides on the main stem. The areas located in the southwestern part of Hertford County and the southeastern part of Gates County are level and gently rolling, with the rolling areas being interspersed with many swamps. Drainage is good for the rolling areas, too poor for the swampy areas.

The area located in the southern part of this section, which includes segments of Bertie and Chowan Counties, has excellent drainage. The area in Bertie County along the Chowan River has an almost continuous, abrupt bluff, 20 to 40 feet in height. The area in Chowan County is level with scattered swampland.

Agriculture is quite diversified in this area. The main cash crops are tobacco, peanuts, corn, and cotton. Commercial truck farming is widespread and increasing each year. The growing of livestock, especially beef cattle, is on the increase.

Industry is invariably small with a large number of logging contractors and sawmills throughout the area. Almost all of the commercial fisheries in the basin are concentrated in this area. Industry, other than lumbering and fishing, is located in and around the Town of Ahoskie, a wholesale and retail center.

Existing Stream Uses

All towns and communities in this area obtain their domestic water supplies from wells. Some industries, such as the commercial fish industry, obtain their industrial water from Chowan River.

The use of the streams for bathing and boating is prevalent throughout this part of the watershed. At the present, the only bathing area being operated for the public is at Colerain Beach. Edenhouse area is widely used for bathing, but has no bathhouse facilities available for the bathers. In addition, there is swimming at Mount Gould, where there is a summer camp sponsored by the Kiwanis for underprivileged boys.

In order to determine the water quality for the bathing area located at Colerain Beach, bacteriological sampling was conducted at several selected points in and near the beach. (Coliform M.P.N. values obtained for each of these points during sampling may be seen on map entitled, "Map of Colerain Beach Showing Coliform Sampling Stations And M.P.N. Values," on page 113). Stream studies indicate that this beach is being polluted by domestic sewage from the Town of Colerain. It appears that the Town of Colerain will have to provide additional waste treatment facilities along with closer supervision of operation and maintenance, if this area is continued to be used for bathing.

Fishing is general throughout the streams of this area, particularly in the main stem. The chief species of fish commonly caught are reported to be bass, perch, bream, jack, and pike. Hunting is carried on in most of the area and is good for quail and fair for wild turkey, deer, and bear.

Livestock watering is the principal agricultural usage of the streams in this portion of the Basin. Irrigation is, however, practiced in some sections and this water usage is increasing.

There are six main commercial fisheries located in this segment of the Basin. All of the fisheries are located on the main stem of the Chowan River. Names and locations of these fisheries are as follows:

Cannons Ferry Fish Company - Cannon Ferry
Chowan Fish Company - Cannon Ferry
M. J. Tynch and Company - Harris Landing
Belch Fish Company - Colerain
Perry-Wynn Fish Company - Colerain
J. W. Waff & Sons - Edenhouse (Chowan Co.)

Generally, all fish houses are operated in the same manner. The operations of the various fish houses are confined mainly during the herring season, which normally begins around the first of April and lasts until the middle of May. Herring is the main fish product, followed by rockfish, perch, shad, carp, and catfish. Plant operations consist of washing and cleaning, packing, and canning of fish roe. Most of the offal (fish solids) are collected and rendered into fish meal. Chowan River water is used for cleaning of fish, and well water is used for cleaning of fish roe. Wastes, consisting of blood, wash water, and some fish solids, are discharged to Chowan River without treatment, which constitute a local pollution problem in the vicinity of the plant. These organic wastes have a high demand for oxygen and cause surface films and other undesirable

conditions. Closer supervision over the collection of offal and other solid waste material should be exercised to prevent it from reaching the stream.

It should be noted here that Belch Fish Company and Perry-Wynn Fish Company are located immediately upstream from Colerain Beach. However, the wastes from the main operation of these plants occur in the off bathing season.

Excluding the commercial fisheries, there are seven significant sources of sewage and industrial waste pollution tributary to the waters in this section of the Basin. The total as expressed in population equivalent (P.E.), based on B.O.D., is estimated to be 3,700 of which an estimated 1,600 is due to industrial wastes. The individual sources of domestic sewage and industrial waste discharges are described below:

Town of Aulander - The public sewerage system serves 650 people and discharges the effluent from its primary treatment plant into Fort Branch that drains into Ahoskie Creek. The effluent from this plant has a P.E. of approximately 500 people and is significant only from the standpoint of local pollution in the receiving stream immediately below the point of discharge. However, the present primary treatment plant is overloaded and is not being properly operated or maintained.

Town of Ahoskie - The public sewerage system receives domestic waste from a population of 3,300 people and industrial wastes from a small laundry and a small milk processing plant. The wastes from these two small industrial plants contribute a waste load having an estimated B.O.D. equivalent to raw sewage from a domestic population of 300 people; therefore, the load tributary to the system is equivalent to domestic sewage normally expected from a population of 3,600 people. These wastes are treated by two small primary type treatment plants, the effluent of which discharges directly to Ahoskie Creek. The Southwest Plant serves a population of 1,980 and discharges an effluent, after treatment, having a P.E. of approximately 1,500 people. The Southeast Plant serves a population of 1,320 people plus industrial wastes having an estimated P.E. of 300; however, this plant was not in service during the time of this survey which resulted in the discharge of raw sewage and industrial wastes having a P.E. of 1,620 directly into Ahoskie Creek. The wastes from these plants result in excessive pollution of Ahoskie Creek and are a potential hazard from the standpoint of development of local nuisance conditions.

Almar Pickle Company at Ahoskie - This company processes and stores cucumbers in brine solutions before shipping to other points for manufacture of cucumber pickles. Seasonal industrial waste having a high salinity content is discharged to a drainage ditch that flows to Horse Swamp. This waste is estimated to have a P.E. of 1,146 people and a flow of 8,000 gallons per day and is significant only from the standpoint of local pollution immediately below the point of discharge.

Ahoskie Package Company discharges a small amount of industrial waste into a drainage ditch which flows into Horse Swamp. This waste amounts to about 2,000 gallons per day and has an estimated P.E. of 120. The effects of these wastes are limited to local pollution in the small receiving stream.

Town of Colerain - The municipal sewerage system serves 365 people and discharges the effluent from a small primary treatment plant into a drainage ditch which flows to Chowan River. The pollution load tributary to the drainage ditch is estimated to equal a P.E. of 274. The conditions observed both at the plant and in the stream below the effluent indicate that the plant is not being properly operated or maintained. The waste from this plant results in excessive pollution of Colerain Beach and is a potential hazard from the standpoint of injury to the health of the bathers.

Gates County Prison Camp #106 discharges treated sewage from a septic tank into a small branch tributary to Bennetts Creek. The system serves 100 people and results in a sewage discharge having an estimated P.E. of 75 to the stream. The pollution is significant primarily from the standpoint of local pollution immediately below the point of discharge.

Chowan High School (Smalls Cross-Road - Chowan County) - This school has an enrollment of 500 students with a domestic sewage flow of approximately 5,000 gallons per day. Waste is being treated by a septic tank with the effluent discharging sewage having an estimated P.E. of 38 to an unnamed stream that flows to Dillards Mill Pond. Due to the fact that unorganized bathing takes place in Dillards Creek, the waste from this plant is a potential hazard from the standpoint of injury to the health of the bathers.

Potential Future Development of the Area

This area has possibilities of further agricultural and industrial development. Increased use of water for irrigation is indicated throughout this area. The waters should in general be protected for fish and wildlife, agricultural and recreational uses, such as bathing and camping.

SECTION IV

SECTION FROM MOUTH OF CHOWAN RIVER, INCLUDING EDENTON BAY AND ADJACENT WATERS, TO A LINE EXTENDING FROM MOUTH OF BLACKWALNUT CREEK TO NORTH END OF NORFOLK-SOUTHERN RAILROAD ALBEMARLE SOUND BRIDGE

Land Characteristics of Uses

The topography of this area, which includes a small segment of Bertie County and a lower portion of Chowan County, is level with elevations a few feet above sea level. The area is more heavily populated than any other area in the entire Basin, mainly because the Town of Edenton is located there.

Industries are variable and are concentrated in and around the Town of Edenton. The largest peanut market in North Carolina is reported to be at Edenton. Other industries located in this area are the shad and herring fisheries with their packing and canning plants; a textile mill that manufactures cotton yarn; fertilizer plants; and lumber and veneer plants.

The soil in this area is fertile and suitable for agricultural purposes. Some of the more important cash crops are peanuts, corn, tobacco, and cotton.

Existing Stream Uses

The Town of Edenton is the only town located in this area, and receives its domestic water supplies from deep wells. One industry, Edenton Cotton Mills, Inc., located at Edenton, obtains water from Queen Anne Creek for industrial use. In addition, most of the commercial fish industries obtain water for industrial use from Edenton Bay.

There is no organized bathing in this section of the Basin. Boating and sport fishing are prevalent in all waters in this area. Fish commonly caught are bass, perch, bream, and jack. Commercial fishing is mainly confined to the main stem of Chowan River and Albemarle Sound.

The agricultural use of the streams is principally that of livestock watering; however, the use of stream water for irrigation purposes is increasing rapidly.

All pollution that originates in this area flows to Edenton Bay. In order to determine the water quality for Edenton Bay, chemical, biochemical, and bacteriological sampling were conducted at several selected points in the bay. Average values for some of these determinations are shown on map entitled, "Map of Edenton Bay Showing Average Analytical Results," on page 111. Complete analytical results may be seen in Table 5 on pages 63 - 100.

Significant sources of pollution in this area are Town of Edenton, Westover Heights (a sub-division located at Edenton), and Holland & Spivey Veneer Mill. The total sewage and waste discharges from these sources excluding fish houses, are estimated as being equivalent in strength to the raw domestic sewage from a population of 5,000. Each source of pollution is described as follows:

Town of Edenton - This is the largest source of municipal pollution in the entire Basin. Raw sewage from 4,600 people and some industrial wastes are discharged through multiple outlets directly into Edenton Bay, and into Pembroke and Queen Anne Creeks. These discharges create sludge deposits and surface films, and result in the presence of organisms of the coliform group (sewage bacteria) far in excess of the maximum limits normally recommended for bathing and recreational uses.

Westover Heights, Edenton, N. C. - This sub-division, located about one mile west of Edenton, has a community sewerage collection system which discharges raw sewage through a single outfall line at a point approximately one-half mile above U. S. Highway #17 Bridge across Pembroke Creek.

Woodland and Spivey Veneer Mill - This veneer mill, located within the corporate limits of the Town of Edenton, discharges industrial waste having an estimated P.E. of 218 people into a drainage ditch which flows through a residential area to Pembroke Creek. Total volume of waste amounts to about 4,000 gallons per day. This organic waste, due to lack of proper dilution, decomposes rapidly, creating odors and unsightly conditions.

Edenton Bay Fish Company - This fish packing plant is located at Edenton. The plant operates throughout most of the year; however, the major operation takes place during the herring season. Main fish products are herring,

rockfish, perch, shad, carp, and catfish. Plant operations consist of washing and cleaning, packing, and canning of fish roe. Edenton [redacted] water is used for cleaning of fish, and [redacted] fish roe. Offal (fish solids) are collected and rendered into fish meal. Domestic sewage and industrial wastes consisting of blood, wash water, and some fish solids are discharged to Edenton Bay without treatment. These wastes produce surface films and other undesirable conditions resulting in pollution problems in the vicinity of the plant.

Potential Future Development of Area

This is probably the best section of the Basin for future industrial development because of the available labor supply in and around the Town of Edenton, and its ease of accessibility by land or by water.

This area, also, has possibilities of further agricultural development, especially as pertaining to truck farming. Increased use of water for irrigation is indicated throughout the area.

If the waters are protected from pollution, Edenton Bay can be developed for recreational purposes.

TABLE 3

PUBLIC GROUND WATER SUPPLIES

CHOWAN RIVER BASIN

Data Collected 1953

Community	Pop. 1950	Est. Pop. Served	Ownership	Estimated Consumption M.G.D.	No. of Wells	Est. Total Yield M.G.D.	Date Installed	Treatment
1. Ahoskie	3,579	3,300	M	0.340	4	1.44	1919, 29, 48, 53	None
2. Aulander	1,112	1,020	M	0.100	1	0.72	1925	None
3. Colerain	367	367	M	0.030	1	0.10	1939	None
4. Conway	618	665	M	0.020	2	0.32	1951	Chlorinator - Fe. Removal Filter - Aerator - ion exchange softening unit
5. Edenton	4,468	4,600	M	0.283	2	1.58	1928, 35	Chlorination - zeolite softening
Westover Heights-Edenton	140	140	M*	0.009	1	0.05	1949	None
6. Murfreesboro	2,140	2,250	M	0.112	2	0.58	1929, 46	None
7. Seaboard	745	707	M	0.027	1	0.12	1941	Iron Remover - Alum, Lime - Rapid Sand Filter Basis
8. Winton	834	700	M	0.027	2	0.72	1936, 48	None
9. Woodland	590	710	M	0.020	2	0.14	1941	None

M - Municipal

* Owned and operated by Town of Edenton

TABLE 4

POINTS OF SIGNIFICANT SOURCES OF POLLUTION

CHOWAN RIVER BASIN

Data Collected 1953

Location	Pop. 1950	Est. Pop. Served	Ownership	Kind of Waste	Est. Gals. Waste M.G.D.	Type of Treatment	Design Capacity M.G.D.	P. E. before Treatment	P. E. after Treatment	Receiving Stream
Ahoskie	3,579									
Southwest Outfall		1,980	M	D.S.	0.158	Primary	0.10	1,980	1,490	Ahoskie Creek
Southeast Outfall		1,320	M	D.S.+	0.106	Primary	0.10	1,320	1,320	Ahoskie Creek
				I.W.	0.014	Same Plant		293	293	Ahoskie Creek
Ahoskie Package Co.			P	I.W.	0.002	None		120	120	Drainage Ditch to Horse Swamp
Almar Pickle Co.			P	I.W.	0.008	None		1,146	1,146	Drainage Ditch to Horse Swamp
Aulander	1,112	650	M	D.S.	0.052	Primary	0.06	650	487	Fort Branch to Ahoskie Creek
Blackwater River	(Municipal and industrial waste discharges in Virginia result in an average organic load of 3990# - 5-day 25°C. B.O.D. at sampling station #7)								23,900	
Chowan High School (Smalls Cross Roads Chowan County)		500	S	D.S.	0.005	Septic tank only		50	38	Unnamed stream to Dillard Creek
Colerain	367	365	M	D.S.	0.024	Primary	0.015	365	274	Drainage Ditch to Chowan River
Edenton	4,468	4,600	M	D.S.	0.226	None		4,600	4,600	Edenton Bay
Westover Heights		140	P	D.S.	0.007	None		140	140	Pembroke Creek
Woodland & Spivey Veneer Mill			P	I.W.	0.004	None		218	218	Drainage Ditch to Pembroke Creek
Gates County Prison Camp #106			S	D.S.	0.010	Septic tank only		100	75	Unnamed Stream to Bennetts Creek
Meherrin River	(Municipal and industrial waste discharges in Virginia result in an average organic load of 1500# - 5-day 25°C. B.O.D. at sampling station #11)								8,980	

TABLE 4

POINTS OF SIGNIFICANT SOURCES OF POLLUTION

CHOWAN RIVER BASIN

Data Collected 1953

Location	Pop. 1950	Est. Pop. Served	Ownership	Kind of Waste	Est. Gals. Waste M.G.D.	Type of Treatment	Design Capacity M.G.D.	P. E. before Treatment	P. E. after Treatment	Receiving Stream
Milwaukee:										
Milwaukee Basket Co.			P	I.W.	0.005	None		252	252	Drainage Ditch to Potecasi Creek
Murfreesboro	2,140									
West Outfall		1,500	M	D.S.)	0.060	None		1,500	1,500	Meherrin River
				I.W.)	0.010	None		500	500	Meherrin River
East Outfall		300	M	D.S.	0.012	None		300	300	Meherrin River
Riverside Manufacturing Co.			P	D.S.)	0.004	None		142	142	Meherrin River
				I.W.)	0.008	None		396	396	Meherrin River
Nottoway River	(Municipal and industrial waste discharges in Virginia result in an average organic load of 3020# - 5-day 25° C. B.O.D. at sampling station #8)								18,100	
Seaboard	742	704	M	D.S.	0.025	Primary	0.075	704	493	Ivy Creek to Cypress Creek
Severn:										
Kirby Chemical Co., Inc.			P	I.W.	250 GPD 25% NA_2SO_4	Lagoon				Meherrin River
Winton	834	604	M	D.S.	0.019	Primary	0.140	604	454	Chowan River
Woodland:										
J. M. Brown & Son			P	I.W.	0.004	None		216	216	Drainage Ditch to Urahaw Swamp
Talon, Inc.		185	P	D.S.	0.004	Septic tanks Filter trench	0.004	37	4	Drainage Ditch to Urahaw Swamp

TABLE 4

POINTS OF SIGNIFICANT SOURCES OF POLLUTION

CHOWAN RIVER BASIN

Data Collected 1953

Commercial Fisheries

In addition to the above there are several fish packing establishments located on the Chowan River and Edenton Bay which discharge undetermined quantities of highly organic wastes into these waters during the herring season, which normally begins around the first of April and lasts until the middle of ~~April~~ May. These plants, employing an estimated total of 695 people, are constructed over the water making it impractical to determine the volume of waste waters discharged. The important packing plants are as follows:

Belch Fish Co. - Colerain - Bertie County
Perry-Wynn Fish Co. - Colerain - Bertie County
Cannons Ferry Fish Co. - Cannons Ferry - Chowan County
Chowan Fish Co. - Cannons Ferry - Chowan County
Edenton Bay Fish Co. - Edenton - Chowan County
M. J. Tynch & Co. - Harris Landing - Chowan County
J. W. Waff & Sons - Edenhouse - Chowan County

M - Municipal; P - Private; D.S. - Domestic Sewage; I.W. - Industrial Waste

* Plant not in service during time of this survey.

TABLE 5

ANALYTICAL RESULTS

Station No. 1 - Pembroke Creek near Edenton, North Carolina — Drainage Area (sq. mi.) 24.6

Date Collected, 1953	6/18	6/19	6/26	7/16	7/22	7/23	8/4	Ave.	Max.	Min.
Time	0650	0500	0845	1700	1100	1300	1500	---	---	---
Discharge (cfs)	0.25	0.12	0.05	0.10	0.04	0.04	0.05	0.09	0.25	0.04
Temperature (°C)	23	23	27	30	30	28	29	27	30	23
pH	6.8	6.9	7.1	7.0	7.5	6.7	7.1	---	7.5	6.7
Alkalinity	38	55	43	45	51	43	49	46	55	38
Chlorides	12	11	12	2	18	10	23	13	23	2
Hardness	42	41	37	60	44	44	50	45	60	37
Dissolved Oxygen	---	2.9	6.1	7.7	5.9	3.4	3.8	5.0	7.7	2.9
% D.O. Saturation	---	33	76	101	78	43	49	63	101	33
BOD ppm (5 Day 20°C)	1.4	1.7	2.6	3.3	2.8	2.3	3.0	2.4	3.3	1.4
BOD lbs./Day @ 25°C	2.4	1.4	0.9	2.2	0.8	0.6	1.0	1.3	2.4	0.6
Coliforms (MPN/100 ml)	300	930	230	430	2,400	230	73	660	2,400	73
Turbidity	18	10	25	30	30	45	22	26	45	10
Color	110	145	65	90	80	65	105	94	145	65
Sulphates	18.2	8.7	15.7	18.2	30	68	15	24.8	68	8.7
Ammonia	0.1	0.2	0.2	0.4	0.5	0.4	0.3	0.3	0.5	0.1
Nitrates	0.18	0.18	0.19	0.13	0.10	0.09	0.15	0.15	0.19	0.09
Nitrites	0.02	0.02	0.01	0.02	0.14	0.01	0.05	0.04	0.14	0.01
Total Solids	112	135	117	126	119	112	130	122	135	112
Suspended Solids	1	3	0	7	5	4	1	3	7	0
Dissolved Solids	111	132	117	119	114	108	129	119	132	108

TABLE 5

ANALYTICAL RESULTS

Station No. 2 - Pembroke Creek at Edenton, North Carolina Drainage Area (sq. mi.) 28.8

Date Collected, 1953	6/18	6/19	6/26	7/16	7/22	7/23	8/4	Ave.	Max.	Min.
Time	0710	0525	0915	1735	1115	1330	1530	---	---	---
Discharge (cfs)	0.3	0.15	0.06	0.12	0.05	0.05	0.06	0.11	0.30	0.05
Temperature (°C)	23	24	28	24	31	29	30	27	31	23
pH	7.0	7.1	7.4	8.0	7.9	7.3	7.8	---	8.0	7.0
Alkalinity	34	45	44	43	52	49	49	45	52	34
Chlorides	9	10	6	22	28	31	66	25	66	6
Hardness	32	33	33	42	42	44	60	41	60	32
Dissolved Oxygen	6.2	6.2	6.9	8.5	5.8	4.8	6.3	6.4	8.5	4.8
% D.O. Saturation	71	73	87	100	77	62	83	79	100	62
BOD ppm (5 Day 20°C)	1.6	2.4	2.1	3.6	3.2	3.0	3.2	2.7	3.6	1.6
BOD lbs./Day @ 25°C	3.2	2.4	0.9	2.9	1.1	1.0	1.3	1.8	3.2	0.9
Coliforms (MPN/100 ml)	1,500	3,200	1,500	2,900	930	730	430	1,600	3,200	430
Turbidity	34	20	27	25	32	30	27	28	34	20
Color	88	88	105	65	70	80	64	80	105	64
Sulphates	10	8	13	35	23	31	23	20	35	8
Ammonia	0.22	0.05	0.3	0.2	0.5	0.3	0.2	0.25	0.5	0.05
Nitrates	0.10	0.13	0.19	0.13	0.17	0.09	0.10	0.13	0.19	0.09
Nitrites	0.02	0.02	0.01	0.02	0.03	0.01	0.05	0.02	0.05	0.01
Total Solids	102	101	87	133	142	129	209	129	209	87
Suspended Solids	10	1	1	9	7	9	1	5	10	1
Dissolved Solids	92	100	86	124	135	120	208	124	208	86

TABLE 5

ANALYTICAL RESULTS

Station No. 3 - Ahoskie Creek near Ahoskie, North Carolina — Drainage Area (sq. mi.) 71.7

Date Collected, 1953	6/18	6/22	7/7	7/13	7/16	7/23	7/24	7/27	7/29	Ave.	Max.	Min.
Time	0945	1545	1750	0945	1215	0545	0950	1340	0810	---	---	---
Discharge (cfs)	0.5	0.2	3.4	37.0	11.0	0.3	0.5	0.2	0.2	5.9	37.0	0.2
Temperature (°C)	20	23	26	19	21	24	25	24	24	23	26	19
pH	6.9	7.1	6.8	6.1	6.5	7.0	6.9	7.2	7.2	---	7.2	6.1
Alkalinity	76	100	62	27	19	76	94	124	129	79	129	19
Chlorides	15	17	2	5	6	13	16	14	17	12	17	2
Hardness	18	32	30	20	32	33	46	48	46	34	48	18
Dissolved Oxygen	1.5	2.2	2.1	5.8	3.7	0.6	0.6	1.8	0.5	2.1	5.8	0.5
% D.O. Saturation	16	25	26	62	41	7	7	21	6	23	62	6
BOD ppm (5 Day 20°C)	3.2	4.7	2.0	1.0	1.0	2.2	3.1	2.6	3.7	2.6	4.7	1.0
BOD lbs./Day @ 25°C	11	6.3	46	250	74	4.5	10	3.5	5.0	46	250	3.5
Coliforms (MPN/100 ml)	4,300	15,000	9,300	46,000	7,500	3,600	240,000	430,000	24,000	87,000	430,000	3,600
Turbidity	72	25	276	27	69	45	78	45	32	74	276	25
Color	175	244	880	195	195	110	370	195	195	284	880	110
Sulphates	1,729*	14.1	18	15	22	40	34	27	7	22	1,729	7
Ammonia	2.5	3.0	1.8	0.4	0.5	2.2	3	3	2.5	2.1	3.0	0.4
Nitrates	0.07	0.20	0.15	0.20	0.10	0.09	0.82	0.13	0.20	0.22	0.82	0.07
Nitrites	0.10	0.01	0.02	0.01	0.05	0.01	0.01	0.02	0.01	0.03	0.10	0.01
Total Solids	2,317*	225	295	130	2,528*	188	318	227	265	235	2,528	130
Suspended Solids	45	8	39	6	29	99	50	9	28	35	99	6
Dissolved Solids	2,272*	217	256	124	2,499*	89	268	218	237	201	2,499	89

* Excluded from average - (See note at end of table)

TABLE 5

ANALYTICAL RESULTS

Station No. 4 - Ahoskie Creek at Ahoskie, North Carolina Drainage Area (sq. mi.) 64.3

Date Collected, 1953	6/18	7/9	7/13	7/16	7/23	Ave.	Max.	Min.
Time	1015	1045	1100	1240	0825	---	---	---
Discharge (cfs)	0.4	19.0	33.0	8.3	0.1	12.2	33.0	0.1
Temperature (°C)	22	24	19	23	24	22	24	19
pH	6.6	5.7	5.6	5.9	6.6	---	6.6	5.6
Alkalinity	51	15	10	13	30	24	51	10
Chlorides	4	3	4	4	8	5	8	3
Hardness	30	14	33	30	30	27	33	14
Dissolved Oxygen	2.3	4.5	5.6	4.5	1.2	3.6	5.6	1.2
% D.O. Saturation	26	53	60	52	14	41	60	14
BOD ppm (5 Day 20°C)	2.1	1.4	0.8	1.9	2.5	1.7	2.5	0.8
BOD lbs./Day @ 25°C	5.7	180	178	106	1.7	94	180	1.7
Coliforms (MFN/100 ml)	13,950	24,000	6,800	680	5,800	10,000	24,000	680
Turbidity	195	192	40	49	41	103	195	40
Color	615	1,760	188	225	245	607	1,760	188
Sulphates	12	36	34	24	46	30	46	12
Ammonia	0.22	0.2	0.36	0.5	0.2	0.30	0.5	0.2
Nitrates	0.15	0.2	0.18	0.14	0.09	0.15	0.2	0.09
Nitrites	0.02	0.04	0.01	0.02	0.01	0.02	0.04	0.01
Total Solids	203	421	121	130	138	203	421	121
Suspended Solids	37	109	4	8	10	34	109	4
Dissolved Solids	166	312	117	122	128	169	312	117

TABLE 5

ANALYTICAL RESULTS

Station No. 5 - Ahoskie Creek near Aulander, North Carolina — Drainage Area (sq. mi.) 43.3

Date Collected, 1953	6/18	7/7	7/9	7/13	7/16	7/24	Ave.	Max.	Min.
Time	1142	1535	0955	1148	1330	0905	---	---	---
Discharge (cfs)	0.2	1.9	13.0	23.0	5.5	0.2	7.3	23.0	0.2
Temperature (°C)	22	30	24	20	22	25	24	30	20
pH	6.2	6.9	5.6	5.7	5.9	6.2	---	6.9	5.6
Alkalinity	22	27	13	14	17	26	20	27	13
Chlorides	6	5	2	4	4	5	4	6	2
Hardness	22	20	18	35	24	40	26	40	18
Dissolved Oxygen	2.6	7.5	4.3	2.8	4.3	0.8	3.7	7.5	0.8
% D.O. Saturation	29	99	50	31	49	10	45	99	10
BOD ppm (5 Day 20°C)	1.6	76.1*	2.6	1.0	2.1	3.4	2.1	3.4	1.0
BOD lbs./Day @ 25°C	2.2	---	228	155	78	4.6	94	228	2.2
Coliforms (MPN/100 ml)	640	230	3,350	2,400	1,500	2,400	1,800	3,350	230
Turbidity	48	88	28	20	75	50	52	88	20
Color	352	480	192	182	230	265	284	480	182
Sulphates	18	25	15	16	20	38	22	38	15
Ammonia	0.2	0.4	0.4	0.39	0.2	0.4	0.33	0.4	0.2
Nitrates	0.17	0.18	0.21	0.15	0.23	0.01	0.16	0.23	0.01
Nitrites	0.02	0.02	0.04	0.01	0.01	0.01	0.02	0.04	0.01
Total Solids	158	205	114	92	124	131	137	205	92
Suspended Solids	19	30	2	2	9	14	13	30	2
Dissolved Solids	139	175	112	90	115	117	125	175	90

* Excluded from average

TABLE 5

ANALYTICAL RESULTS

Station No. 6 - Chowan River at Winton, North Carolina Drainage Area (sq. mi.) 4198

Date Collected, 1953	6/18	6/22	7/7	7/9	7/15	7/16	7/28	Ave.	Max.	Min.
Time	1245	1800	1455	0700	0525	0950	0535	---	---	---
Discharge (cfs)	1,380	800	540	1,050	260	330	175	648	1,380	175
Temperature (°C)	21	28	33	29	26	---	28	28	33	21
pH	7.0	8.1	8.2	6.8	7.1	6.9	7.2	---	8.2	6.8
Alkalinity	30	38	68	29	39	32	41	40	68	29
Chlorides	4	1	0	2	2	3	5	2	5	0
Hardness	44	22	14	24	20	42	38	29	44	14
Dissolved Oxygen	6.4	9.7	8.9	6.4	4.4	5.4	6.1	6.8	9.7	4.4
% D.O. Saturation	71	122	122	82	54	---	77	88	122	54
BOD ppm (5 Day 20°C)	1.6	2.6*	3.9	1.2	0.8	2.1	2.2	2.0	3.9	0.8
BOD lbs./Day @ 25°C	14,900	---	14,200	8,500	1,400	4,680	2,600	7,710	14,900	1,400
Coliforms (MPN/100 ml)	91	150	---	2,400	430	300	930	720	2,400	91
Turbidity	16	18	48	18	25	48	18	27	48	16
Color	110	78	170	145	195	115	24	120	195	24
Sulphates	17	23	32	16	15	19	7	18	32	7
Ammonia	0.0	0.4	0.2	0.2	0.3	0.2	0.4	0.2	0.4	0
Nitrates	0.09	0.16	0.17	0.04	0.05	0.08	0.17	0.11	0.17	0.04
Nitrites	0.02	0.01	0.03	0.06	0.05	0.02	0.03	0.03	0.06	0.01
Total Solids	86	78	101	107	100	91	89	93	107	78
Suspended Solids	7	3	20	0	4	13	1	7	20	0
Dissolved Solids	79	75	81	107	96	78	88	86	107	75

* Excluded from average - 6 day BOD

TABLE 5

ANALYTICAL RESULTS

Station No. 7 - Blackwater River near South Quay, Virginia — Drainage Area (sq. mi.) 719

Date Collected, 1953	6/24	6/30	7/2	7/10	7.14	7/27	7/30	Ave.	Max.	Min.
Time	0800	1040	1125	1000	0610	1615	1415	---	---	---
Discharge (cfs)	28	160	100	250	60	9	12	88	250	9
Temperature (°C)	27	35	31	28	25	31	29	29	35	25
pH	7.3	7.3	7.2	6.9	7.1	7.4	7.3	---	7.4	6.9
Alkalinity	130	194	130	78	79	95	108	116	194	78
Chlorides	3	7	12	7	5	6	7	7	12	3
Hardness	38	40	35	50	22	44	40	38	50	22
Dissolved Oxygen	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0
% D.O. Saturation	1	0	0	0	0	1	1	0	1	0
BOD ppm (5 Day 20°C)	8.0	10.9	8.6	4.0	4.2	4.8	0.8	5.9	10.9	0.8
BOD lbs./Day @ 25°C	1,510	11,800	5,800	6,750	1,700	292	65	3,990	11,800	65
Coliforms (MPN/100 ml)	430	930	2,400	300	230	230	230	680	2,400	230
Turbidity	31	9	14	18	16	12	20	17	31	9
Color	360	720	480	145	210	245	280	349	720	145
Sulphates	15	24*	74	12	34	6	7	25	74	6
Ammonia	0.8	0.4	0.3	0.3	0.6	0.4	0.3	0.4	0.8	0.3
Nitrates	0.30	0.15	0.10	0.09	0.12	0.18	0.14	0.15	0.30	0.09
Nitrites	0.01	0.01	0.0	0.01	0.03	0.01	0.01	0.01	0.03	0.0
Total Solids	263	396	283	152	200	224	255	254	396	152
Suspended Solids	0	4	5	1	2	0	6	3	6	0
Dissolved Solids	263	392	278	151	198	224	249	251	392	151

* Excluded from average - approximate

TABLE 5

ANALYTICAL RESULTS

Station No. 8 - Nottoway River near Franklin, Virginia

Drainage Area (sq. mi.) 1742

Date Collected, 1953	6/24	6/30	7/2	7/10	7/14	7/27	7/30	Ave.	Max.	Min.
Time	0840	1125	1200	1025	0635	1635	1440	---	---	---
Discharge (cfs)	291	214	208	289	167	115	88	196	291	88
Temperature (°C)	26	30	31	29	26	30	30	29	31	26
pH	7.0	7.0	7.2	7.0	7.0	7.7	7.1	---	7.7	7.0
Alkalinity	24	28	29	44	38	32	38	33	44	24
Chlorides	3	2	4	4	4	4	4	4	4	2
Hardness	18	20	22	26	44	34	26	27	44	18
Dissolved Oxygen	8.2	6.3	7.4	5.5	6.1	7.2	6.6	6.8	8.2	5.5
% D.O. Saturation	100	83	99	71	74	95	87	87	100	71
BOD ppm (5 Day 20°C)	3.4	2.0	2.8	0.9	2.1	2.2	3.0	2.3	3.4	0.9
BOD lbs./Day @ 25°C	6,680	2,890	3,930	1,760	2,370	1,710	1,780	3,020	6,680	1,710
Coliforms (MPN/100 ml)	91	43	240	21	73	150	430	150	430	21
Turbidity	21	23	12	16	16	20	35	20	35	12
Color	144	92	80	59	80	49	80	83	144	49
Sulphates	20	6	9	12	12	8	7	11	20	6
Ammonia	0.5	0.3	0.2	0.1	0.3	0.2	0.1	0.2	0.5	0.1
Nitrates	0.20	0.03	0.13	0.09	0.01	0.08	0.06	0.09	0.20	0.01
Nitrites	0.01	0.01	0.02	0.01	0.09	0.02	0.04	0.03	0.09	0.01
Total Solids	75	92	71	79	90	75	84	81	92	71
Suspended Solids	3	1	1	7	14	0	10	5	14	0
Dissolved Solids	72	91	70	72	76	75	74	76	91	70

TABLE 5

ANALYTICAL RESULTS

Station No. 9 - Meherrin River near Severn, North Carolina — Drainage Area (sq. mi.) 1115

Date Collected, 1953	6/24	6/30	7/2	7/14	7/24	7/29	7/30	Ave.	Max.	Min.
Time	1030	1352	1415	0905	0705	0535	1625	---	---	---
Discharge (cfs)	150	200	310	92	235	47	490	218	490	47
Temperature (°C)	26	29	30	24	27	26	29	27	30	24
pH	7.0	7.0	7.3	7.2	7.3	7.4	7.4	---	7.4	7.0
Alkalinity	34	30	36	41	50	47	44	40	50	30
Chlorides	2	2	4	4	5	2	2	3	5	2
Hardness	24	22	26	36	44	44	36	33	44	22
Dissolved Oxygen	5.7	6.0	6.5	6.6	6.8	6.0	7.7	6.5	7.7	5.7
% D.O. Saturation	69	77	85	77	84	73	99	81	99	69
BOD ppm (5 Day 20°C)	0.8	2.1	1.1	0.6	3.1	2.0	3.2	1.8	3.2	0.6
BOD lbs./Day @ 25°C	810	2,840	2,300	373	4,920	634	10,600	3,210	10,600	373
Coliforms (MPN/100 ml)	290	1,200	230	36	15,000	230	230	2,500	15,000	36
Turbidity	108	82	35	27	69	37	37	56	108	27
Color	320	228	145	170	105	120	70	165	320	70
Sulphates	8	12	10	14	32	10	31	17	32	8
Ammonia	0.6	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.6	0.1
Nitrates	0.14	0.03	0.07	0.09	0.01	0.08	0.06	0.07	0.14	0.01
Nitrites	0.01	0.02	0.03	0.01	0.01	0.02	0.04	0.02	0.04	0.01
Total Solids	139	121	108	108	100	119	129	118	139	100
Suspended Solids	23	20	20	15	42	17	33	24	42	15
Dissolved Solids	116	101	88	93	58	102	96	94	116	58

TABLE 5

ANALYTICAL RESULTS

Station No. 10 - Meherrin River at railroad bridge at Severn, N. C. Drainage Area (sq. mi.) 1115

Date Collected, 1953	6/24	6/30	7/2	7/14	7/27	Ave.	Max.	Min.
Time	1000	1325	1530	0835	1735	---	---	---
Discharge (cfs)	150	200	310	92	112	173	310	92
Temperature (°C)	26	29	30	23	27	27	30	23
pH	7.0	7.0	7.4	7.1	7.7	---	7.7	7.0
Alkalinity	31	31	36	40	44	36	44	31
Chlorides	2	3	4	4	3	3	4	2
Hardness	21	22	26	36	36	28	36	21
Dissolved Oxygen	6.0	6.0	6.5	7.0	8.1	6.7	8.1	6.0
% D.O. Saturation	73	77	85	81	100	83	100	73
BOD ppm (5 Day 20°C)	0.6	1.1	1.2	1.4	2.5	1.4	2.5	0.6
BOD lbs./Day @ 25°C	608	1,480	2,510	869	1,890	1,470	2,510	608
Coliforms (MPN/100 ml)	230	930	430	930	430	590	930	230
Turbidity	98	92	48	27	20	57	98	20
Color	280	217	170	145	74	177	280	74
Sulphates	10	14	10	13	9	11	14	9
Ammonia	0.4	0.2	0.2	0.1	0.2	0.2	0.4	0.1
Nitrates	0.14	0.03	0.07	0.09	0.14	0.09	0.14	0.03
Nitrites	0.01	0.01	0.03	0.01	0.01	0.01	0.03	0.01
Total Solids	137	114	105	111	92	112	137	92
Suspended Solids	19	17	23	12	9	16	23	9
Dissolved Solids	118	97	82	99	83	96	118	82

TABLE 5

ANALYTICAL RESULTS

Station No. 11 - Meherrin River near Margarettsville, North Carolina — Drainage Area (sq. mi.) 1074

Date Collected, 1953	6/24	6/30	7/2	7/14	7/22	7/24	7/29	8/3	Ave.	Max.	Min.
Time	1125	1430	1615	0940	0800	0750	0610	1830	---	---	---
Discharge (cfs)	150	155	285	85	82	325	55	90	153	325	55
Temperature (°C)	26	28	---	23	27	28	25	26	26	28	23
pH	7.0	7.1	7.2	7.1	7.3	7.1	7.5	7.4	---	7.5	7.0
Alkalinity	33	33	35	41	47	47	47	45	41	47	33
Chlorides	3	4	4	3	4	4	3	4	4	4	3
Hardness	23	25	24	34	32	42	34	34	31	42	23
Dissolved Oxygen	6.2	6.0	6.4	6.9	6.3	6.4	6.3	6.3	6.5	6.9	6.0
% D.O. Saturation	75	76	---	79	78	81	75	77	76	81	75
BOD ppm (5 Day 20°C)	0.7	0.8	1.2	1.3	2.3	2.2	2.0	1.0	1.4	2.3	0.7
BOD lbs./Day @ 25°C	709	837	2,310	746	1,270	4,830	742	608	1,500	4,830	608
Coliforms (MPN/100 ml)	430	230	430	110	4,300	2,400	430	91	1,100	4,300	91
Turbidity	84	23	39	20	45	32	37	20	38	84	20
Color	260	157	105	145	80	70	95	74	123	260	70
Sulphates	19	12	7	13	28	28	10	10	16	28	7
Ammonia	0.6	0.2	0.2	0.2	0.4	0.2	0.1	0.3	0.3	0.6	0.1
Nitrates	0.15	0.03	0.08	0.09	0.04	0.05	0.06	0.03	0.07	0.15	0.03
Nitrites	0.01	0.02	0.02	0.01	0.01	0.05	0.04	0.07	0.03	0.07	0.01
Total Solids	116	143	86	105	113	2,338*	115	85	109	2,338	85
Suspended Solids	18	10	9	11	21	24	23	8	16	24	8
Dissolved Solids	98	133	77	94	92	2,314*	92	77	95	2,314	77

* Excluded from average - (See note at end of table)

TABLE 5

ANALYTICAL RESULTS

Station No. 12 - Cypress Creek at Margarettsville, North Carolina Drainage Area (sq. mi.) 29.8

Date Collected, 1953	6/24	6/30	7/2	7/4	7/22	7/24	Ave.	Max.	Min.
Time	1145	1500	1635	1010	0745	0810	---	---	---
Discharge (cfs)	0.08	0.6	0.5	0.1	0.02	0.06	0.23	0.6	0.02
Temperature (°C)	24	25	27	21	23	25	24	27	21
pH	6.8	6.4	6.5	6.5	6.7	---	---	6.8	6.4
Alkalinity	26	16	17	19	29	---	21	29	16
Chlorides	5	4	5	4	5	5	5	5	4
Hardness	19	23	22	46	26	36	29	46	19
Dissolved Oxygen	3.7	5.5	4.4	4.9	3.7	3.0	4.2	5.5	3.0
% D.O. Saturation	43	66	55	54	43	36	50	66	36
BOD ppm (5 Day 20°C)	1.0	0.8	1.2	0.9	1.1	1.5	1.1	1.5	0.8
BOD lbs./Day @ 25°C	0.5	3.2	4.0	0.6	0.1	0.6	1.5	4.0	0.1
Coliforms (MPN/100 ml)	430	930	4,300	210	4,300	2,400	2,100	4,300	210
Turbidity	12	23	10	42	30	30	25	42	10
Color	144	105	120	120	115	115	120	144	105
Sulphates	15	12	12	13	30	28	18	30	12
Ammonia	0.5	0.2	0.25	0.2	0.5	0.2	0.31	0.5	0.2
Nitrates	0.2	0.08	0.14	0.15	0.12	0.01	0.12	0.2	0.01
Nitrites	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.01
Total Solids	82	85	80	81	74	81	81	85	74
Suspended Solids	1	4	1	5	2	9	4	9	1
Dissolved Solids	81	81	79	76	72	72	77	81	72

TABLE 5

ANALYTICAL RESULTS

Station No. 13 - Meherrin River at Murfressboro, North Carolina Drainage Area (sq. mi.) 1360

Date Collected, 1953	7/8	7/10	7/16	7/20	7/21	7/27	8/4	8/6	Ave.	Max.	Min.
Time	1140	0745	0600	1550	1330	1825	0835	1730	---	---	---
Discharge (cfs)	172	276	182	144	75	150	90	110	150	276	75
Temperature (°C)	29	28	25	27	---	29	28	28	28	29	25
pH	7.1	6.8	7.2	7.1	7.7	7.7	7.3	7.2	---	7.7	6.8
Alkalinity	23	33	36	38	44	44	45	45	39	45	23
Chlorides	3	3	3	4	6	4	6	5	4	6	3
Hardness	26	28	40	30	42	38	32	30	33	42	26
Dissolved Oxygen	4.8	4.7	6.1	6.6	5.9	4.2	3.9	3.6	5.0	6.6	3.6
% D.O. Saturation	62	59	73	82	---	54	49	45	61	82	45
BOD ppm (5 Day 20°C)	1.1	0.8	2.6	2.0	2.4	4.4	2.6	1.2	2.1	4.4	0.8
BOD lbs./Day @ 25°C	1,280	1,490	3,190	1,940	1,220	4,460	1,580	891	2,010	4,460	891
Coliforms (MPN/100 ml)	720	>11,000*	93,000	24,000	24,000	9,300	---	2,400	26,000	93,000	720
Turbidity	37	27	40	37	27	48	30	27	34	48	27
Color	120	156	80	80	64	80	74	80	92	156	64
Sulphates	---	---	11	21	11	24	10	7	14	24	7
Ammonia	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1
Nitrates	0.14	0.09	0.09	0.06	0.1	0.06	0.09	0.12	0.09	0.14	0.06
Nitrites	0.01	0.01	0.01	0.04	0.05	0.04	0.01	0.03	0.03	0.05	0.01
Total Solids	96	101	96	104	88	76	96	97	94	104	76
Suspended Solids	15	10	25	11	6	11	10	8	12	25	6
Dissolved Solids	81	91	71	93	82	65	86	89	82	93	65

* Excluded from average

TABLE 5

ANALYTICAL RESULTS

Station No. 14 - Meherrin River near Murfreesboro, North Carolina Drainage Area (sq. mi.) 1360

Date Collected, 1953	7/8	7/10	7/16	7/20	7/21	7/27	7/28	Ave.	Max.	Min.
Time	1100	0720	1110	1530	1300	1835	0615	---	---	---
Discharge (cfs)	172	276	182	144	75	150	70	153	276	70
Temperature (°C)	29	28	28	28	---	29	27	28	29	27
pH	7.1	6.8	8.0	7.1	7.3	8.2	7.1	---	8.2	6.8
Alkalinity	32	32	39	40	39	43	46	39	46	32
Chlorides	3	3	3	4	5	8	4	4	8	3
Hardness	25	29	35	33	34	38	47	34	47	25
Dissolved Oxygen	4.9	4.6	6.0	6.6	5.8	5.6	4.5	5.4	6.6	4.5
% D.O. Saturation	63	58	76	83	---	72	56	68	83	56
BOD ppm (5 Day 20°C)	1.5	1.2	4.7	2.6	2.6	4.2	2.4	2.7	4.7	1.2
BOD lbs./Day @ 25°C	1,740	2,240	5,770	2,530	1,320	4,250	1,130	2,710	5,770	1,130
Coliforms (MPN/100 ml)	25,000	2,000	46,000	78,000	78,000	58,000	27,000	45,000	78,000	2,000
Turbidity	28	30	52	42	22	22	35	33	52	22
Color	92	158	68	98	70	56	70	87	158	56
Sulphates	544*	7	24	25	6	8	6	13	544	6
Ammonia	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.2	0.3	0.1
Nitrates	0.10	0.12	0.08	0.08	0.06	0.06	0.5	0.14	0.5	0.06
Nitrites	0.03	0.01	0.02	0.05	0.04	0.04	0.03	0.03	0.05	0.01
Total Solids	1,021*	96	100	91	90	87	90	92	1,021	87
Suspended Solids	6	13	4	13	2	4	7	7	13	2
Dissolved Solids	1,015*	83	96	78	88	83	83	85	1,015	78

* Excluded from average - (See note at end of table)

TABLE 5

ANALYTICAL RESULTS

Station No. 15 - Potecasi Creek near Mapleton, North Carolina Drainage Area (sq. mi.) 204

Date Collected, 1953	6/25	7/1	7/6	7/7	7/8	7/23	7/30	Ave.	Max.	Min.
Time	1045	1305	1525	1620	0950	0650	1800	---	---	---
Discharge (cfs)	1.5	2.0	20.0	5.0	10.0	1.4	2.0	6.0	20.0	1.4
Temperature (°C)	26	28	27	28	27	26	28	27	28	26
pH	6.5	6.3	6.4	6.5	6.5	6.6	6.8	---	6.8	6.3
Alkalinity	18	16	21	26	31	25	24	23	31	16
Chlorides	5	3	3	4	7	8	5	5	8	3
Hardness	17	14	17	31	24	24	22	21	31	14
Dissolved Oxygen	5.0	4.0	1.5	1.7	2.5	3.4	3.1	3.0	5.0	1.5
% D.O. Saturation	61	50	19	21	31	41	39	37	61	19
BOD ppm (5 Day 20°C)	2.2	1.6	0.9	1.4	0.6	0.6	0.9	1.2	2.2	0.6
BOD lbs./Day @ 25°C	22	22	122	47	40	5.7	12	39	122	5.7
Coliforms (MPN/100 ml)	230	430	230	150	230	730	930	420	930	150
Turbidity	27	62	216	27	120	65	37	79	216	27
Color	195	1,775	750	510	310	220	155	559	1,775	155
Sulphates	14	20	19	---	14	29	12	18	29	12
Ammonia	0.3	0.25	0.3	0.3	0.2	0.2	0.2	0.25	0.3	0.2
Nitrates	0.17	0.13	0.15	0.18	0.15	0.15	0.10	0.15	0.18	0.10
Nitrites	0.01	0.02	0.02	0.02	0.05	0.01	0.05	0.03	0.05	0.01
Total Solids	113	410	195	166	137	112	103	176	410	103
Suspended Solids	14	104	16	19	2	9	14	25	104	2
Dissolved Solids	99	306	179	147	135	103	89	151	306	89

TABLE 5

ANALYTICAL RESULTS

Station No. 16 - Meherrin River at Parkers Ferry, North Carolina Drainage Area (sq. mi.) 1616

Date Collected, 1953	6/25	7/1	7/6	7/8	7/22	7/30	Ave.	Max.	Min.
Time	1015	1245	1450	0900	0545	1705	---	---	---
Discharge (cfs)	250	205	310	200	110	370	241	370	110
Temperature (°C)	27	32	31	29	28	31	30	32	27
pH	6.9	7.1	7.4	7.0	7.0	8.3	---	8.3	6.9
Alkalinity	32	28	31	53	39	44	38	53	28
Chlorides	4	3	3	4	4	2	3	4	2
Hardness	20	20	21	22	24	26	22	26	20
Dissolved Oxygen	6.9	7.7	6.7	5.2	4.4	5.1	6.0	7.7	4.4
% D.O. Saturation	85	104	89	67	56	68	78	104	56
BOD ppm (5 Day 20°C)	1.8	2.2	2.2	0.9	1.2	5.5	2.3	5.5	0.9
BOD lbs./Day @ 25°C	3,040	3,040	4,600	1,220	891	13,700	4,420	13,700	891
Coliforms (MPN/100 ml)	430	110	---	36	930	430	390	930	36
Turbidity	56	18	20	56	48	23	37	56	18
Color	205	155	130	80	130	70	128	205	70
Sulphates	13	8	14	1,116*	28	8	14	1,116	8
Ammonia	1.4	0.2	0.25	0.3	0.4	0.2	0.46	1.4	0.2
Nitrates	0.15	0.07	0.12	0.1	0.12	0.07	0.11	0.15	0.07
Nitrites	0.01	0.03	0.03	0.05	0.03	0.03	0.03	0.05	0.01
Total Solids	97	95	76	1,897*	118	99	97	1,897	76
Suspended Solids	14	10	1	7	10	10	9	14	1
Dissolved Solids	83	85	75	1,890*	108	89	88	1,890	75

* Excluded from average - (See note at end of table)

TABLE 5

ANALYTICAL RESULTS

Station No. 17 - Chowan River near Parkers Ferry, North Carolina — Drainage Area (sq. mi.) 2565

Date Collected, 1953	7/8	7/15	7/16	7/20	7/21	7/22	7/27	Ave.	Max.	Min.
Time	1300	0650	0840	1655	1055	0535	1500	---	---	---
Discharge (cfs)	710	180	160	120	120	170	120	226	710	120
Temperature (°C)	28	26	28	29	---	27	31	28	31	26
pH	7.3	7.0	7.1	7.2	7.2	7.1	7.8	---	7.8	7.0
Alkalinity	32	47	40	39	52	44	46	43	52	32
Chlorides	2	3	4	5	5	3	4	4	5	2
Hardness	20	24	24	28	28	24	28	25	28	20
Dissolved Oxygen	5.1	3.4	5.1	5.0	2.9	4.4	4.2	4.3	5.1	2.9
% D.O. Saturation	64	41	64	64	---	55	56	57	64	41
BOD ppm (5 Day 20°C)	1.6	1.0	2.0	2.8	3.8	1.2	4.9	2.5	4.9	1.0
BOD lbs./Day @ 25°C	7,670	1,220	2,160	2,270	3,080	1,380	3,970	3,110	7,670	1,220
Coliforms (MPN/100 ml)	91	23	430	91	4,600	93	43	770	4,600	23
Turbidity	14	20	53	48	25	37	42	34	53	14
Color	120	220	155	80	195	130	130	147	220	80
Sulphates	16	11	18	23	8	51	19	21	51	8
Ammonia	0.1	0.2	0.2	0.3	0.4	0.4	0.2	0.3	0.4	0.1
Nitrates	0.13	0.09	0.08	0.16	0.08	0.12	0.17	0.12	0.17	0.08
Nitrites	0.02	0.01	0.02	0.04	0.02	0.02	0.03	0.02	0.04	0.01
Total Solids	86	116	102	143	116	103	125	113	143	86
Suspended Solids	0	4	15	18	1	2	8	7	18	0
Dissolved Solids	86	112	87	125	115	101	117	106	125	86

TABLE 5

ANALYTICAL RESULTS

Station No. 18 - Chowan River at Tunis, North Carolina Drainage Area (sq. mi.) 4226

Date Collected, 1953	6/25	7/1	7/3	7/9	7/16	7/20	7/28	7/30	Ave.	Max.	Min.
Time	0900	1100	0720	1150	1450	1800	0515	1315	---	---	---
Discharge (cfs)	520	585	650	1,060	350	250	180	460	507	1,060	180
Temperature (°C)	27	30	28	29	31	28	27	31	29	31	27
pH	7.0	7.4	7.0	7.0	8.2	7.2	7.3	7.3	---	8.2	7.0
Alkalinity	33	31	35	30	32	40	36	35	34	40	30
Chlorides	4	4	2	2	4	4	4	2	3	4	2
Hardness	22	21	24	25	22	30	30	22	25	30	21
Dissolved Oxygen	6.2	7.9	5.1	6.3	8.0	7.2	6.1	7.5	6.8	8.0	5.1
% D.O. Saturation	77	104	64	81	107	91	76	100	88	107	64
BOD ppm (5 Day 20°C)	1.7	3.6	1.6	1.6	3.2	2.2	1.5	2.6	2.2	3.6	1.5
BOD lbs./Day @ 25°C	5,970	14,200	7,020	11,400	7,560	3,710	1,820	8,070	7,470	14,200	1,820
Coliforms (MPN/100 ml)	36	33	29	158	43	91	---	230	90	230	29
Turbidity	18	26	26	20	57	30	27	35	30	57	18
Color	89	152	170	158	105	155	95	120	131	170	89
Sulphates	14	13	10	16	19	26	---	7	15	26	7
Ammonia	0.23	0.2	0.2	0.2	0.2	0.1	0.4	0.3	0.23	0.4	0.1
Nitrates	0.14	0.07	0.08	0.08	0.17	0.1	0.13	0.14	0.11	0.17	0.07
Nitrites	0.01	0.03	0.02	0.04	0.03	0.05	0.02	0.01	0.03	0.05	0.01
Total Solids	87	90	91	102	85	91	3,464*	87	90	3,464	85
Suspended Solids	2	6	3	8	12	19	14	11	9	19	2
Dissolved Solids	85	84	88	94	73	72	3,450*	76	82	3,450	72

* Excluded from average - (See note at end of table)

TABLE 5

ANALYTICAL RESULTS

Station No. 19 - Wiccacon River near Harrellsville, North Carolina Drainage Area (sq. mi.) 257

Date Collected, 1953	6/25	7/1	7/6	7/9	7/15	7/21	7/23	7/30	Ave.	Max.	Min.
Time	1125	1415	1610	0900	0455	0925	0725	1830	---	---	---
Discharge (cfs)	2.0	4.0	34.0	90.0	31.0	1.1	0.9	0.6	20.4	90.0	0.6
Temperature (°C)	28	30	32	28	25	---	26	31	29	32	25
pH	6.7	7.0	7.5	6.5	6.3	6.5	6.6	7.0	---	7.5	6.3
Alkalinity	25	23	22	22	19	22	21	26	22	26	19
Chlorides	4	5	4	3	2	5	7	4	4	7	2
Hardness	18	20	18	28	16	28	28	21	22	28	16
Dissolved Oxygen	4.7	11.1	9.8	3.5	1.3	2.4	1.0	6.5	5.0	11.1	1.0
% D.O. Saturation	59	145	132	44	16	---	12	87	71	145	12
BOD ppm (5 Day 20°C)	3.8	4.6	2.4	3.1	1.4	2.0	1.2	2.4	2.6	4.6	1.2
BOD lbs./Day @ 25°C	51	124	551	1,880	293	15	7.3	9.7	366	1,880	7.3
Coliforms (MPN/100 ml.)	36	23	150	75	93	93	430	430	170	430	23
Turbidity	23	22	29	25	35	30	37	25	28	37	22
Color	230	205	207	245	155	170	260	170	205	260	155
Sulphates	16	14	15	16	1,406*	46	39	9	22	1,406	9
Ammonia	0.5	0.3	0.4	0.2	0.3	0.4	0.2	0.3	0.3	0.5	0.2
Nitrates	0.20	0.08	0.18	0.15	0.14	0.09	0.15	0.18	0.15	0.20	0.08
Nitrites	0.01	0.02	0.02	0.05	0.01	0.01	0.05	0.02	0.02	0.05	0.01
Total Solids	102	97	103	97	2,280*	83	97	82	94	2,280	82
Suspended Solids	1	7	8	11	20	2	6	11	8	20	1
Dissolved Solids	101	90	95	86	2,260*	81	91	71	88	2,260	71

* Excluded from average - (See note at end of table)

TABLE 5

ANALYTICAL RESULTS

Station No. 20 - Chowan River near Harrellsville, North Carolina Drainage Area (sq. mi.) 4589

Date Collected, 1953	7/13	7/15	7/20	7/21	7/24	7/30	8/3	Ave.	Max.	Min.
Time	0620	0940	1400	0820	1240	1915	1625	---	---	---
Discharge (cfs)	840	315	250	195	545	455	200	400	840	195
Temperature (°C)	27	26	31	29	26	29	28	28	31	26
pH	6.8	7.1	8.0	7.3	---	7.3	7.2	---	8.0	6.8
Alkalinity	28	27	31	31	---	30	30	30	31	27
Chlorides	4	3	5	5	9	4	5	5	9	3
Hardness	42	22	26	28	46	23	28	31	46	22
Dissolved Oxygen	6.1	6.3	7.3	7.0	6.9	6.4	5.1	6.4	7.3	5.1
% D.O. Saturation	76	77	97	90	84	82	64	81	97	64
BOD ppm (5 Day 20°C)	0.8	1.3	2.0	2.0	2.2	1.9	1.1	1.6	2.2	0.8
BOD lbs./Day @ 25°C	4,540	2,760	3,380	2,630	8,090	5,840	1,480	4,100	8,090	1,480
Coliforms (MPN/100 ml)	73	---	30	4,600	91	230	91	850	4,600	30
Turbidity	16	16	32	23	30	37	27	26	37	16
Color	155	55	115	105	95	70	95	99	155	55
Sulphates	16	1,171*	33	16	26	26	20	23	1,171	16
Ammonia	0.2	0.2	0.2	0.4	0.3	0.2	0.2	0.2	0.4	0.2
Nitrates	0.09	0.09	0.14	0.23	0.22	0.16	0.17	0.16	0.23	0.09
Nitrites	0.01	0.01	0.06	0.02	0.03	0.04	0.03	0.03	0.06	0.01
Total Solids	82	1,492*	79	81	81	81	80	81	1,492	79
Suspended Solids	7	7	10	0	5	6	3	5	10	0
Dissolved Solids	75	1,485*	69	81	76	75	77	76	1,485	69

* Excluded from average - (See note at end of table)

TABLE 5

ANALYTICAL RESULTS

Station No. 21 - Chowan River near Colerain, North Carolina — Drainage Area (sq. mi.) 4799

Date Collected, 1953	7/13	7/15	7/20	7/21	8/3	8/10	Ave.	Max.	Min.
Time	0810	1120	1255	0550	1515	1710	---	---	---
Discharge (cfs)	850	330	260	200	200	310	358	850	200
Temperature (°C)	25	---	28	28	29	29	28	29	25
pH	7.2	7.4	7.6	7.0	7.1	7.8	---	7.8	7.0
Alkalinity	27	28	32	30	30	31	30	32	27
Chlorides	4	5	8	6	7	10	7	10	4
Hardness	38	22	27	34	35	22	30	38	22
Dissolved Oxygen	7.4	7.2	7.4	6.8	6.3	7.4	7.1	7.4	6.3
% D.O. Saturation	88	---	93	86	81	95	89	95	81
BOD ppm (5 Day 20°C)	1.4	1.2	2.0	1.4	1.2	1.5	1.4	2.0	1.2
BOD lbs./Day @ 25°C	8,030	2,670	3,510	1,890	1,620	3,140	3,480	8,030	1,620
Coliforms (MPN/100 ml)	---	30	36	3.6	29	36	27	36	3.6
Turbidity	18	22	39	34	28	20	27	39	18
Color	170	118	88	110	75	69	105	170	69
Sulphates	9.8	72	1,185*	30	24	22	32	1,185	9.8
Ammonia	0.3	0.2	0.2	0.4	0.2	0.2	0.2	0.4	0.2
Nitrates	0.15	0.14	0.12	0.08	0.15	0.04	0.11	0.15	0.04
Nitrites	0.01	0.03	0.06	0.02	0.02	0.06	0.03	0.06	0.01
Total Solids	85	172	1,282*	80	98	92	105	1,282	80
Suspended Solids	14	13	6	10	6	3	9	14	3
Dissolved Solids	71	159	1,276*	70	92	89	96	1,276	70

* Excluded from average - (See note at end of table)

TABLE 5

ANALYTICAL RESULTS

Station No. 23A - Edenton Bay

Date Collected, 1953	7/30	8/4	8/5	8/6	Ave.	Max.	Min.
Time	0815	1020	1410	1235	---	---	---
Discharge (cfs)	---	---	---	---	---	---	---
Temperature (°C)	29	28	29	28	28	29	28
pH	7.5	7.3	8.1	7.6	---	8.1	7.3
Alkalinity	39	43	46	50	45	50	39
Chlorides	84	172	175	173	151	175	84
Hardness	62	98	96	85	85	98	62
Dissolved Oxygen	6.4	7.0	7.8	6.6	7.0	7.8	6.4
% D.O. Saturation	82	88	100	83	88	100	82
BOD ppm (5 Day 20°C)	1.8	1.2	1.5	1.6	1.5	1.8	1.2
BOD lbs./Day @ 25°C	---	---	---	---	---	---	---
Coliforms (MPN/100 ml)	24,000	430	930	430	6,400	24,000	430
Turbidity	22	27	58	---	36	58	22
Color	70	41	25	---	45	70	25
Sulphates	8	19	8	---	12	19	8
Ammonia	0.2	0.2	0.2	---	0.2	0.2	0.2
Nitrates	0.08	0.10	0.09	---	0.09	0.10	0.08
Nitrites	0.02	0.01	0.01	---	0.01	0.02	0.01
Total Solids	232	402	447	---	360	447	232
Suspended Solids	1	0	11	---	4	11	0
Dissolved Solids	231	402	436	---	356	436	231

TABLE 5

ANALYTICAL RESULTS

Station No. 23B - Edenton Bay

Date Collected, 1953	7/30	8/4	8/5	8/6	Ave.	Max.	Min.
Time	0825	1025	1410	1235	---	---	---
Discharge (cfs)	---	---	---	---	---	---	---
Temperature (°C)	29	28	29	28	28	29	28
pH	7.5	7.3	8.2	8.0	---	8.2	7.3
Alkalinity	37	43	44	44	42	44	37
Chlorides	84	180	190	201	164	201	84
Hardness	22	102	102	98	81	102	22
Dissolved Oxygen	5.1	6.9	7.7	6.1	6.5	7.7	5.1
% D.O. Saturation	66	87	99	77	82	99	66
BOD ppm (5 Day 20°C)	1.8	1.4	1.2	1.1	1.4	1.8	1.1
BOD lbs./Day @ 25°C	---	---	---	---	---	---	---
Coliforms (MPN/100 ml)	2,400	4,300	930	2,400	2,500	4,300	930
Turbidity	35	35	18	---	29	35	18
Color	70	44	44	---	53	70	44
Sulphates	28	21	9	---	19	28	9
Ammonia	0.2	0.1	0.1	---	0.1	0.2	0.1
Nitrates	0.1	0.0	0.15	---	0.08	0.15	0.0
Nitrites	0.05	0.1	0.05	---	0.07	0.1	0.05
Total Solids	249	425	455	---	376	455	249
Suspended Solids	9	0	1	---	3	9	0
Dissolved Solids	240	425	454	---	373	454	240

TABLE 5

ANALYTICAL RESULTS

Station No. 23C - Edenton Bay

Date Collected, 1953	7/30	8/4	8/5	8/6	Ave.	Max.	Min.
Time	0830	1030	1405	1230	---	---	---
Discharge (cfs)	---	---	---	---	---	---	---
Temperature (°C)	29	28	29	28	28	29	28
pH	7.7	7.8	8.2	8.0	---	8.2	7.7
Alkalinity	40	43	45	45	43	45	40
Chlorides	86	170	207	218	170	218	86
Hardness	64	100	100	104	92	104	64
Dissolved Oxygen	6.7	6.7	7.6	5.9	6.7	7.6	5.9
% D.O. Saturation	86	85	98	74	86	98	74
BOD ppm (5 Day 20°C)	1.7	1.8	1.5	1.7	1.7	1.8	1.5
BOD lbs./Day @ 25°C	---	---	---	---	---	---	---
Coliforms (MPN/100 ml)	3,900	910	2,300	9,300	4,100	9,300	910
Turbidity	53	22	37	---	37	53	22
Color	95	46	70	---	70	95	46
Sulphates	31	32	21	---	28	32	21
Ammonia	0.2	0.1	0.1	---	0.1	0.2	0.1
Nitrates	0.08	0.07	0.13	---	0.09	0.13	0.07
Nitrites	0.02	0.07	0.02	---	0.04	0.07	0.02
Total Solids	275	420	499	---	398	499	275
Suspended Solids	10	3	12	---	8	12	3
Dissolved Solids	265	417	487	---	390	487	265

TABLE 5

ANALYTICAL RESULTS

Station No. 24A - Edenton Bay

Date Collected, 1953	7/30	8/4	8/5	8/6	Ave.	Max.	Min.
Time	0830	1045	1430	1300	---	---	---
Discharge (cfs)	---	---	---	---	---	---	---
Temperature (°C)	29	28	29	28	28	29	28
pH	7.6	8.2	8.1	7.9	---	8.2	7.6
Alkalinity	38	44	47	41	42	47	38
Chlorides	91	157	204	187	160	204	91
Hardness	68	84	98	102	88	102	68
Dissolved Oxygen	6.7	7.3	7.6	6.1	6.9	7.6	6.1
% D.O. Saturation	86	92	98	77	88	98	77
BOD ppm (5 Day 20°C)	1.4	1.2	1.0	1.3	1.2	1.4	1.0
BOD lbs./Day @ 25°C	---	---	---	---	---	---	---
Coliforms (MPN/100 ml)	230	11,000	430	930	3,100	11,000	230
Turbidity	30	32	27	---	30	32	27
Color	80	41	49	---	57	80	41
Sulphates	23	16	12	---	17	23	12
Ammonia	0.2	1.0	0.2	---	0.5	1.0	0.2
Nitrates	0.12	0.06	0.10	---	0.09	0.12	0.06
Nitrites	0.03	0.06	0.06	---	0.05	0.06	0.03
Total Solids	256	456	399	---	370	456	256
Suspended Solids	9	12	6	---	9	12	6
Dissolved Solids	247	444	393	---	361	444	247

TABLE 5
ANALYTICAL RESULTS

Station No. 24B - Edenton Bay

Date Collected, 1953	7/30	8/4	8/5	8/6	Ave.	Max.	Min.
Time	0835	1050	1420	1255	---	---	---
Discharge (cfs)	---	---	---	---	---	---	---
Temperature (°C)	29	28	29	28	28	29	28
pH	7.9	8.2	8.1	7.9	---	8.2	7.9
Alkalinity	38	47	46	44	44	47	38
Chlorides	87	188	201	196	168	201	87
Hardness	62	94	100	102	90	102	62
Dissolved Oxygen	6.9	7.2	7.5	6.4	7.0	7.5	6.4
% D.O. Saturation	89	91	97	81	90	97	81
BOD ppm (5 Day 20°C)	1.4	1.3	1.0	1.0	1.2	1.4	1.0
BOD lbs./Day @ 25°C	---	---	---	---	---	---	---
Coliforms (MPN/100 ml)	4,600	3,900	360	910	2,400	4,600	360
Turbidity	20	20	32	---	24	32	20
Color	55	46	49	---	50	55	46
Sulphates	7	9	24	---	13	24	7
Ammonia	0.2	0.3	0.2	---	0.2	0.3	0.2
Nitrates	0.13	0.08	0.04	---	0.08	0.13	0.04
Nitrites	0.02	0.02	0.06	---	0.03	0.06	0.02
Total Solids	225	458	448	---	377	458	225
Suspended Solids	5	1	8	---	5	8	1
Dissolved Solids	220	457	440	---	372	457	220

TABLE 5

ANALYTICAL RESULTS

Station No. 24C - Edenton Bay

Date Collected, 1953	7/30	8/4	8/5	8/6	Ave.	Max.	Min.
Time	0845	1055	1425	1250	---	---	---
Discharge (cfs)	---	---	---	---	---	---	---
Temperature (°C)	29	28	29	28	28	29	28
pH	7.9	8.2	8.1	7.9	---	8.2	7.9
Alkalinity	39	44	45	45	43	45	39
Chlorides	87	217	206	188	175	217	87
Hardness	62	96	96	102	89	102	62
Dissolved Oxygen	7.2	6.9	7.9	6.2	7.1	7.9	6.2
% D.O. Saturation	93	87	102	78	90	102	78
BOD ppm (5 Day 20°C)	1.3	1.4	1.1	1.2	1.2	1.4	1.1
BOD lbs./Day @ 25°C	---	---	---	---	---	---	---
Coliforms (MPN/100 ml)	230	4,600	930	430	1,500	4,600	230
Turbidity	27	20	49	---	32	49	20
Color	105	44	30	---	60	105	30
Sulphates	8	22	20	---	17	22	8
Ammonia	0.3	0.2	0.2	---	0.2	0.3	0.2
Nitrates	0.10	0.07	0.10	---	0.09	0.10	0.07
Nitrites	0.04	0.07	0.06	---	0.06	0.07	0.04
Total Solids	236	450	467	---	385	467	236
Suspended Solids	2	4	11	---	6	11	2
Dissolved Solids	234	446	456	---	379	456	234

TABLE 5

ANALYTICAL RESULTS

Station No. 24D - Edenton Bay

Date Collected, 1953	7/30	8/4	8/5	8/6	Ave.	Max.	Min.
Time	0900	1100	1420	1245	---	---	---
Discharge (cfs)	---	---	---	---	---	---	---
Temperature (°C)	29	28	29	28	28	29	28
pH	7.9	8.2	8.2	7.9	---	8.2	7.9
Alkalinity	42	45	45	43	44	45	42
Chlorides	87	226	225	147	171	226	87
Hardness	64	108	104	187	116	187	64
Dissolved Oxygen	7.1	7.4	8.0	7.3	7.5	8.0	7.1
% D.O. Saturation	91	93	103	92	95	103	91
BOD ppm (5 Day 20°C)	1.6	2.1	1.3	1.3	1.6	2.1	1.3
BOD lbs./Day @ 25°C	---	---	---	---	---	---	---
Coliforms (MPN/100 ml)	91	11,000	200	430	2,900	11,000	91
Turbidity	25	20	25	---	23	25	20
Color	80	51	56	---	62	80	51
Sulphates	7.2	14.0	11.0	---	10.7	14.0	7.2
Ammonia	0.2	0.2	0.1	---	0.2	0.2	0.1
Nitrates	0.13	0.07	0.01	---	0.07	0.13	0.01
Nitrites	0.02	0.07	0.01	---	0.03	0.07	0.01
Total Solids	244	360	543	---	382	543	244
Suspended Solids	6	5	7	---	6	7	5
Dissolved Solids	238	355	536	---	376	536	238

TABLE 5

ANALYTICAL RESULTS

Station No. 25A - Edenton Bay

Date Collected, 1953	7/30	8/4	8/5	8/6	Ave.	Max.	Min.
Time	1040	1210	1600	1430	---	---	---
Discharge (cfs)	---	---	---	---	---	---	---
Temperature (°C)	29	28	29	28	28	29	28
pH	7.9	7.9	7.9	7.9	---	7.9	7.9
Alkalinity	38	43	45	42	42	45	38
Chlorides	150	210	86	156	151	210	86
Hardness	84	124	66	82	89	124	66
Dissolved Oxygen	7.7	7.2	7.8	7.2	7.5	7.8	7.2
% D.O. Saturation	100	91	100	91	96	100	91
BOD ppm (5 Day 20°C)	1.2	1.2	1.0	1.0	1.1	1.2	1.0
BOD lbs./Day @ 25°C	---	---	---	---	---	---	---
Coliforms (MPN/100 ml)	230	11,000	91	290	2,900	11,000	91
Turbidity	25	18	27	---	23	27	18
Color	54	41	51	---	49	54	41
Sulphates	8	10	33	---	17	33	8
Ammonia	0.2	0.2	0.1	---	0.2	0.2	0.1
Nitrates	0.07	0.07	0.01	---	0.05	0.07	0.01
Nitrites	0.03	0.07	0.01	---	0.04	0.07	0.01
Total Solids	363	465	235	---	354	465	235
Suspended Solids	4	2	5	---	4	5	2
Dissolved Solids	359	463	230	---	351	463	230

TABLE 5
ANALYTICAL RESULTS

Station No. 25B - Edenton Bay

Date Collected, 1953	7/30	8/4	8/5	8/6	Ave.	Max.	Min.
Time	1050	1205	1555	1430	---	---	---
Discharge (cfs)	---	---	---	---	---	---	---
Temperature (°C)	29	28	29	28	28	29	28
pH	7.9	7.9	8.2	8.0	---	8.2	7.9
Alkalinity	37	44	43	45	42	45	37
Chlorides	101	238	87	181	152	238	87
Hardness	66	114	68	104	88	114	66
Dissolved Oxygen	7.6	7.1	7.7	7.4	7.5	7.7	7.1
% D.O. Saturation	98	90	100	93	95	100	90
BOD ppm (5 Day 20°C)	1.0	1.0	0.8	1.1	1.0	1.1	0.8
BOD lbs./Day @ 25°C	---	---	---	---	---	---	---
Coliforms (MPN/100 ml)	430	930	110	280	440	930	110
Turbidity	27	25	18	---	23	27	18
Color	70	41	46	---	52	70	41
Sulphates	8.0	34.0	9.6	---	17.2	34.0	8.0
Ammonia	0.2	0.3	0.1	---	0.2	0.3	0.1
Nitrates	0.07	0.07	0.01	---	0.05	0.07	0.01
Nitrites	0.03	0.07	0.01	---	0.04	0.07	0.01
Total Solids	260	548	257	---	355	548	257
Suspended Solids	10	1	6	---	6	10	1
Dissolved Solids	250	547	251	---	349	547	250

TABLE 5

ANALYTICAL RESULTS

Station No. 25C - Edenton Bay

Date Collected, 1953	7/30	8/4	8/5	8/6	Ave.	Max.	Min.
Time	1030	1155	1550	1425	---	---	---
Discharge (cfs)	---	---	---	---	---	---	---
Temperature (°C)	29	28	29	28	28	29	28
pH	7.9	7.9	8.2	8.0	---	8.2	7.9
Alkalinity	38	44	45	46	43	46	38
Chlorides	106	228	137	199	168	228	106
Hardness	72	112	84	100	92	112	72
Dissolved Oxygen	6.6	8.1	8.1	7.1	7.5	8.1	6.6
% D.O. Saturation	85	102	104	90	95	104	85
BOD ppm (5 Day 20°C)	1.6	0.9	1.0	1.0	1.1	1.6	0.9
BOD lbs./Day @ 25°C	---	---	---	---	---	---	---
Coliforms (MPN/100 ml)	930	36	230	>11,000*	400	>11,000	36
Turbidity	27	27	18	---	24	27	18
Color	55	51	46	---	51	55	46
Sulphates	6	10	8	---	8	10	6
Ammonia	0.2	0.3	0.2	---	0.2	0.3	0.2
Nitrates	0.1	0.05	0.01	---	0.05	0.1	0.01
Nitrites	0.05	0.05	0.01	---	0.04	0.05	0.01
Total Solids	273	519	342	---	378	519	273
Suspended Solids	10	2	2	---	5	10	2
Dissolved Solids	263	517	340	---	373	517	263

* Excluded from average

TABLE 5

ANALYTICAL RESULTS

Station No. 25D - Edenton Bay

Date Collected, 1953	7/30	8/4	8/5	8/6	Ave.	Max.	Min.
Time	1010	1150	1545	1420	---	---	---
Discharge (cfs)	---	---	---	---	---	---	---
Temperature (°C)	29	28	29	28	28	29	28
pH	7.9	7.9	8.2	8.0	---	8.2	7.9
Alkalinity	38	42	47	45	43	47	38
Chlorides	103	211	197	167	170	211	103
Hardness	68	104	100	98	93	104	68
Dissolved Oxygen	7.3	6.8	7.4	7.3	7.2	7.4	6.8
% D.O. Saturation	94	86	95	92	92	95	86
BOD ppm (5 Day 20°C)	1.4	1.3	1.1	1.1	1.2	1.4	1.1
BOD lbs./Day @ 25°C	---	---	---	---	---	---	---
Coliforms (MPN/100 ml)	4,600	930	150	210	1,500	4,600	150
Turbidity	25	27	18	---	23	27	18
Color	54	41	54	---	50	54	41
Sulphates	10	13	12	---	12	13	10
Ammonia	0.3	0.3	0.2	---	0.3	0.3	0.2
Nitrates	0.13	0.03	0.01	---	0.06	0.13	0.01
Nitrites	0.02	0.07	0.01	---	0.03	0.07	0.01
Total Solids	278	493	455	---	409	493	278
Suspended Solids	9	3	7	---	3	9	3
Dissolved Solids	269	490	448	---	402	490	269

TABLE 5

ANALYTICAL RESULTS

Station No. 25E - Edenton Bay

Date Collected, 1953	7/30	8/4	8/5	8/6	Ave.	Max.	Min.
Time	1000	1145	1540	1415	---	---	---
Discharge (cfs)	---	---	---	---	---	---	---
Temperature (°C)	29	28	29	28	28	29	28
pH	7.9	7.9	8.2	8.0	---	8.2	7.9
Alkalinity	37	43	46	42	42	46	37
Chlorides	156	254	232	184	207	254	156
Hardness	82	118	116	92	102	118	82
Dissolved Oxygen	7.7	6.3	8.2	7.9	7.5	8.2	6.3
% D.O. Saturation	100	80	106	100	96	106	80
BOD ppm (5 Day 20°C)	1.2	1.0	1.2	1.3	1.2	1.3	1.0
BOD lbs./Day @ 25°C	---	---	---	---	---	---	---
Coliforms (MPN/100 ml)	230	91	150	1,500	490	1,500	91
Turbidity	22	35	18	---	25	35	18
Color	49	41	56	---	49	56	41
Sulphates	17	23	10	---	17	23	10
Ammonia	0.2	0.2	0.2	---	0.2	0.2	0.2
Nitrates	0.08	0.05	0.01	---	0.05	0.08	0.01
Nitrites	0.02	0.05	0.01	---	0.03	0.05	0.01
Total Solids	373	563	566	---	501	566	373
Suspended Solids	2	1	9	---	4	9	1
Dissolved Solids	371	562	557	---	497	562	371

TABLE 5

ANALYTICAL RESULTS

Station No. 27 - Chowan River near Edenton, North Carolina Drainage Area (sq. mi.) 4871

Date Collected, 1953	6/19	6/23	6/26	7/16	7/22	7/23	7/24	Ave.	Max.	Min.
Time	0720	1525	0510	1800	1130	0928	1405	---	---	---
Discharge (cfs)	1,060	530	500	370	265	305	540	510	1,060	265
Temperature (°C)	23	27	26	28	29	26	27	27	29	23
pH	7.4	7.7	7.4	8.3	8.1	7.5	---	---	8.3	7.4
Alkalinity	34	35	35	37	46	38	---	38	46	34
Chlorides	5	7	6	18	39	33	25	19	39	5
Hardness	22	25	25	36	43	37	40	33	43	22
Dissolved Oxygen	7.5	8.1	7.1	9.2	8.1	6.7	7.3	7.7	9.2	6.7
% D.O. Saturation	86	100	86	116	104	82	90	95	116	82
BOD ppm (5 Day 20°C)	1.1	1.3	0.8	2.9	1.1	0.8	1.3	1.3	2.9	0.8
BOD lbs./Day @ 25°C	7,870	4,650	2,700	7,240	1,970	1,650	4,740	4,400	7,870	1,650
Coliforms (MPN/100 ml)	91	9.1	42	9.1	430	43	43	95	430	9.1
Turbidity	22	20	22	50	20	32	27	28	50	20
Color	115	100	94	80	61	80	95	89	115	61
Sulphates	12.4	10.1	15.4	20.6	8.0	25.9	20.0	16.0	25.9	8.0
Ammonia	0.03	0.4	0.8	0.2	0.2	0.3	0.4	0.33	0.8	0.03
Nitrates	0.11	0.20	0.15	0.18	0.12	0.10	0.07	0.13	0.20	0.07
Nitrites	0.01	0.01	0.01	0.02	0.02	0.01	0.03	0.02	0.03	0.01
Total Solids	93	171	87	96	137	117	131	119	171	87
Suspended Solids	5	5	2	5	1	1	7	4	7	1
Dissolved Solids	88	166	85	91	136	116	124	115	166	85

TABLE 5

ANALYTICAL RESULTS

Station No. 29 - Urahaw Swamp near Rich Square, North Carolina Drainage Area (sq. mi.) 20.4

Date Collected, 1953	11/11	11/12	11/13	11/17	Ave.	Max.	Min.
Time	1100	1405	0800	1700	---	---	---
Discharge (cfs)	5.5	5.0	4.5	2.5	4.4	5.5	2.5
Temperature (°C)	9	9	7	12	9	12	7
pH	6.3	6.2	6.3	6.4	---	6.4	6.2
Alkalinity	19	19	21	28	22	28	19
Chlorides	10	10	12	11	11	12	10
Hardness	42	44	36	32	39	44	32
Dissolved Oxygen	6.1	6.5	5.5	3.8	5.5	6.5	3.8
% D.O. Saturation	53	56	45	35	47	56	35
BOD ppm (5 Day 20°C)	4.6	1.6	1.8	3.6	2.9	4.6	1.6
BOD lbs./Day @ 25°C	171	54	55	61	85	171	54
Coliforms (MPN/100 ml)	4,300	2,100	2,400	930	2,400	4,300	930
Turbidity	30	100	90	37	64	100	30
Color	350	390	245	245	308	390	245
Sulphates	3.8	5.7	6.0	5.7	5.3	6.0	3.8
Ammonia	0.40	0.30	0.20	0.60	0.38	0.60	0.20
Nitrates	0.73	0.08	0.06	0.10	0.24	0.73	0.06
Nitrites	0.02	0.02	0.01	0.10	0.04	0.10	0.01
Total Solids	209	150	146	165	168	209	146
Suspended Solids	60	34	30	34	40	60	30
Dissolved Solids	149	116	116	131	128	149	116

TABLE 5

ANALYTICAL RESULTS

Station No. 30 - Urahaw Swamp near Woodland, North Carolina Drainage Area (sq. mi.) 51.9

Date Collected, 1953	11/11	11/12	11/13	11/17	Ave.	Max.	Min.
Time	1045	1350	0745	1650	---	---	---
Discharge (cfs)	10	10	11	11	10	11	10
Temperature (°C)	9	9	7	11	9	11	7
pH	5.9	5.6	5.7	5.7	---	5.9	5.6
Alkalinity	13	10	11	9	11	13	9
Chlorides	11	9	10	10	10	11	9
Hardness	28	40	26	24	30	40	24
Dissolved Oxygen	5.5	6.8	6.5	6.0	6.2	6.8	5.5
% D.O. Saturation	47	59	53	54	53	59	47
BOD ppm (5 Day 20°C)	2.6	1.4	1.5	0.8	1.6	2.6	0.8
BOD lbs./Day @ 25°C	176	94	111	59	110	176	59
Coliforms (MPN/100 ml)	930	240	930	430	630	930	240
Turbidity	15	20	15	18	17	20	15
Color	105	55	90	59	77	105	55
Sulphates	3.8	5.5	6.6	351.0*	5.3	351	3.8
Ammonia	0.50	0.30	0.20	0.30	0.33	0.50	0.20
Nitrates	0.40	0.20	0.05	0.10	0.19	0.40	0.05
Nitrites	0.01	0.01	0.05	0.10	0.04	0.10	0.01
Total Solids	115	98	108	3,112*	107	3,112	98
Suspended Solids	16	3	12	10	10	16	3
Dissolved Solids	99	95	96	3,102*	97	3,102	95

* Excluded from average - (See note at end of table)

TABLE 5

ANALYTICAL RESULTS

Station No. 31 - Potecasi Creek near Woodland, North Carolina — Drainage Area (sq. mi.) 129

Date Collected, 1953	11/11	11/12	11/13	11/17	Ave.	Max.	Min.
Time	1030	1330	0730	1640	---	---	---
Discharge (cfs)	28	26	26	23	26	28	23
Temperature (°C)	9	9	7	10	9	10	7
pH	5.9	6.2	6.4	6.2	---	6.4	5.9
Alkalinity	15	17	19	15	17	19	15
Chlorides	10	7	10	5	8	10	5
Hardness	26	40	22	20	27	40	20
Dissolved Oxygen	6.6	7.2	7.0	5.9	6.7	7.2	5.9
% D.O. Saturation	57	62	58	52	57	62	52
BOD ppm (5 Day 20°C)	2.2	1.3	1.5	1.4	1.6	2.2	1.3
BOD lbs./Day @ 25°C	416	228	263	217	281	416	217
Coliforms (MPN/100 ml)	2,400	430	150	150	780	2,400	150
Turbidity	8	12	14	10	11	14	8
Color	90	80	80	65	79	90	65
Sulphates	3.9	7.5	6.6	5.6	5.9	7.5	3.9
Ammonia	0.50	0.30	0.20	0.40	0.35	0.50	0.20
Nitrates	0.50	0.20	0.35	0.15	0.30	0.50	0.15
Nitrites	0.01	0.05	0.05	0.05	0.04	0.05	0.01
Total Solids	93	131	77	92	98	131	77
Suspended Solids	8	3	5	0	4	8	0
Dissolved Solids	85	128	72	92	94	128	72

Note - Analytical Results

It will be noted that for several stations, the observed values for sulfates and solids were exceedingly high. Inasmuch as there appears to be no logical explanation for the high values obtained, such values are not included in the averages.

EXPLANATION OF TABLE 6, RECOMMENDED CLASSIFICATIONS

The tentative recommended classifications of the surface waters in the Chowan River Basin which were surveyed are given in Table 6, pages 102 - 110. These recommendations are considered to represent the best usages of the streams in the interest of the public, and are submitted to all concerned for consideration at the Public Hearings, and the State Stream Sanitation Committee in its determination of the final classifications.

* Any stream not named in Table 6, carries the same classification as the segment of the stream to which it is tributary.

Key to Abbreviations Used in Table

Agri.	Agriculture	PL	Peatland
DS	Domestic Sewage	Pri.	Primary
F	Farms	S	Swampland
IW	Industrial Waste	Sec.	Secondary
N	Natural	SP	Slight Pollution
P	Polluted	W & F	Woodland and Farmlands
PA	Populated Area		

Brief Explanation of Water Classifications

A-I Water Supply from Uninhabited Watersheds requiring only approved disinfection.

A-II Water Supply with approved complete treatment.

B Bathing and Recreation.

C Fishing.

D Agriculture including irrigation and livestock watering, and industrial cooling and process water supply.

E Navigation and disposal of sewage, industrial wastes or other wastes.

TABLE 6

RECOMMENDED CLASSIFICATIONS

CHOWAN RIVER BASIN

Stream	Character of District	Condition of Waters	Chief Present Usage	Best Usage	Proposed Class	Comments
I. Chowan River from North Carolina - Virginia Line to Mouth of Meherrin River.	PL & S	P	Fishing	Fishing	C	Domestic and industrial waste from Va.
A. Buckhorn Creek	S; W & F	N	Fishing	Fishing	C	
B. Somerton Creek from N. C.-Va. Line to Mouth.	S; W & F	N	Fishing	Fishing	C	
1. Unnamed Creek from source to N. C. - Va. Line.	S; W & F	N	Agri.	Agri.	D	
2. Beaverdam Creek from source to N. C. - Va. Line.	S; W & F	N	Agri.	Agri.	D	
3. Laster Jordan Branch	S; W & F	N	Agri.	Agri.	D	
C. Meherrin River - That portion below N. C. - Va. State Line to Mouth.	S; W & F	SP	Fishing	Fishing	C	D.S. & I.W. from Virginia; D.S. & I.W. from Murfreesboro; D.S. & I.W. from Riverside Mfg. Co; & I.W. from Kirby Chemical Co.
1. Beaverpond Creek from source to N. C. - Va. Line.	W & F	N	Agri.	Agri.	D	
2. Jacks Swamp from source to N. C. - Va. Line.	S; W & F	N	Agri.	Agri.	D	
3. Cypress Creek from source to N. C. - Va. Line.	S; W & F	N	Fishing	Fishing	C	

TABLE 6

RECOMMENDED CLASSIFICATIONS

CHOWAN RIVER BASIN

Stream	Character of District	Condition of Waters	Chief Present Usage	Best Usage	Proposed Class	Comments
a. Ivy Creek	W & F	SP	Agri.	Agri.	D	Partially treated D.S. from Seaboard.
4. Kirby Creek	S; W & F	N	Fishing	Fishing	C	Primary treated D.S. from Conway High School - Northampton Co.
a. Corduroy Swamp	S; W & F	N	Fishing	Fishing	C	
(1) Hunting Branch	S; W & F	N	Agri.	Agri.	D	
b. Rogers Swamp	S; W & F	N	Agri.	Agri.	D	
c. Reedy Branch	S; W & F	N	Agri.	Agri.	D	
d. Maple Fork Branch (Turkey Creek)	S; W & F	N	Agri.	Agri.	D	
5. Banks Branch	S; W & F	N	Agri.	Agri.	D	
6. Hares Branch	S; W & F	N	Agri.	Agri.	D	
a. Institute Branch	W & F	N	Agri.	Agri.	D	
7. Liverman Creek	S; W & F	N	Agri.	Agri.	D	
8. Potecasi Creek	S; W & F	N	Fishing	Fishing	C	I.W. from Milwaukee Basket Co.
a. Ramsey Creek	S; W & F	N	Agri.	Agri.	D	
b. Wildcat Swamp	S; W & F	N	Agri.	Agri.	D	
c. Paddys Delight Creek	S; W & F	N	Bathing	Bathing	B	
d. Urahaw Swamp	S; W & F	N	Agri.	Agri.	D	I.W. from J. M. Brown & Son, and D.S. from Talon, Inc.
(1) Quarter Swamp	S; W & F	N	Agri.	Agri.	D	

TABLE 6

RECOMMENDED CLASSIFICATIONS

CHOWAN RIVER BASIN

Stream	Character of District	Condition of Waters	Chief Present Usage	Best Usage	Proposed Class	Comments
(2) Bear Swamp	S; W & F	N	Agri.	Agri.	D	
(3) Grant Branch	S; W & F	N	Agri.	Agri.	D	
e. Painter Swamp	S; W & F	N	Agri.	Agri.	D	
(1) Canal Swamp	S; W & F	N	Agri.	Agri.	D	
f. Marl Branch	W & F	N	Agri.	Agri.	D	
g. Old Tree Swamp	S; W & F	N	Agri.	Agri.	D	
h. Cutawhiskie Swamp	S; W & F	N	Agri.	Fishing	C	
(1) Chapel Branch	S; W & F	N	Agri.	Agri.	D	
(2) Bluewater Branch	S; W & F	N	Agri.	Agri.	D	
(3) Indian Creek	S; W & F	N	Agri.	Agri.	D	
i. Hot House Branch	S; W & F	N	Agri.	Agri.	D	
j. Bells Branch	S; W & F	N	Agri.	Agri.	D	
k. Mill Branch	S; W & F	N	Agri.	Agri.	D	
II. Chowan River from Mouth of Meherrin River to Atlantic Coast Line Railroad Chowan River Bridge at Tunis.	PL; PA; W & F	SP	Bathing	Bathing	B	Primary treated D.S. from Winton, N. C.
A. Deep Creek	S; W & F	N	Fishing	Fishing	C	
B. Mud Creek	PL	N	Fishing	Fishing	C	

TABLE 6

RECOMMENDED CLASSIFICATIONS

CHOWAN RIVER BASIN

	Stream	Character of District	Condition of Waters	Chief Present Usage	Best Usage	Proposed Class	Comments
III.	Chowan River from Atlantic Coast Line Railroad Chowan River Bridge at Tunis to Mouth with exception of Bathing Areas (see note at end of table).	W & F	N	Fishing	Fishing	C	Primary treated D.S. from Colerain, N. C.
	A. Catharine Creek	S; W & F	N	Fishing	Fishing	C	
	B. Buckhorn Creek	PL	N	Fishing	Fishing	C	
	C. Spikes Creek	PL	N	Fishing	Fishing	C	
	D. Barnes Creek	PL	N	Fishing	Fishing	C	
	E. Sarem Creek	S; W & F	N	Fishing	Fishing	C	
	1. Jady Branch	W & F	N	Agri.	Agri.	D	
	2. Licking Branch	S; W & F	N	Agri.	Agri.	D	
	3. Cypress Swamp	S; W & F	N	Agri.	Agri.	D	
	4. Gum Branch	S; W & F	N	Agri.	Agri.	D	
	5. Cole Creek	S; W & F	N	Fishing	Fishing	C	
	a. Hacklan Branch	S; W & F	N	Agri.	Agri.	D	
	(1) Flat Branch (Jones Swamp)	S; W & F	N	Agri.	Agri.	D	
	b. Bucklan Mill Branch	S; W & F	N	Agri.	Agri.	D	
	F. Hodges Creek	S	N	Fishing	Fishing	C	
	G. Miccacon River from source at Turnpike Branch to Mouth.	S; W & F	N	Fishing	Fishing	C	

TABLE 6

RECOMMENDED CLASSIFICATIONS

CHOWAN RIVER BASIN

Stream	Character of District	Condition of Waters	Chief Present Usage	Best Usage	Proposed Class	Comments
1. Ahoskie Creek from source to N. C. Hwy. 97 & 350 Bridge located on Highway from Ahoskie to Powellsville.	S; W & F	SP	Agri.	Agri.	D	Partially treated D.S. & I.W. from Ahoskie.
a. Mill Branch	S; W & F	N	Agri.	Agri.	D	
b. Fort Branch	S; W & F	P	Agri.	Agri.	D	Partially treated D.S. from Aulander, N. C.
c. Turkey Creek	S; W & F	N	Agri.	Agri.	D	
d. Knee Branch	S; W & F	N	Agri.	Agri.	D	
e. Snake Branch	S; W & F	N	Agri.	Agri.	D	
f. Stoney Creek	S; W & F	N	Agri.	Agri.	D	
(1) Beaverdam Swamp	S; W & F	N	Agri.	Agri.	D	
(2) Wildcat Swamp	S; W & F	N	Agri.	Agri.	D	
(a) Loosing Swamp	S; W & F	N	Agri.	Agri.	D	
(3) Quioccosin Swamp	S; W & F	N	Agri.	Agri.	D	
2. Ahoskie Creek from N. C. Hwy. #97-350 Bridge to confluence with Wiccacon River.	S; W & F	N	Fishing	Fishing	C	

TABLE 6

RECOMMENDED CLASSIFICATIONS

CHOWAN RIVER BASIN

Stream	Character of District	Condition of Waters	Chief Present Usage	Best Usage	Proposed Class	Comments
a. Whitecoak Swamp	S; W & F	N	Agri.	Agri.	D	
b. Bear Swamp	S; W & F	N	Fishing	Fishing	C	
(1) Horse Swamp	S; W & F	N	Agri.	Agri.	D	I.W. from Almar Pickle Co. & I.W. from Ahoskie Package Co.
(2) Flat Swamp	S; W & F	N	Agri.	Agri.	D	
3. Turnpike Branch	S; W & F	N	Agri.	Agri.	D	
4. Chinkapin Creek	S; W & F	N	Fishing	Fishing	C	
a. Chinkapin Swamp	S; W & F	N	Agri.	Agri.	D	
(1) Peele Branch	W & F	N	Agri.	Agri.	D	
(2) Bull Branch	W & F	N	Agri.	Agri.	D	
(3) Cabin Branch	W & F	N	Agri.	Agri.	D	
(4) Cypress Swamp	S; W & F	N	Agri.	Agri.	D	
b. Barbecue Swamp	S; W & F	N	Agri.	Agri.	D	
(1) Long Branch	S & W	N	Agri.	Agri.	D	
c. Kill'em Swamp	S & W	N	Agri.	Agri.	D	
(1) Long Branch	S & W	N	Agri.	Agri.	D	
5. Brooks Creek	S; W & F	N	Agri.	Agri.	D	
H. Goose Creek	S	N	Fishing	Fishing	C	
I. Deep Swamp Branch	S; W & F	N	Fishing	Fishing	C	
J. Bennetts Creek	PL; S; W & F	N	Fishing	Fishing	C	Partially treated D.S. from Gates County Prison Camp #106.

TABLE 6

RECOMMENDED CLASSIFICATIONS

CHOWAN RIVER BASIN

Stream	Character of District	Condition of Waters	Chief Present Usage	Best Usage	Proposed Class	Comments
1. Duke Swamp	S; W & F	N	Agri.	Agri.	D	
a. Goodman Swamp	S: W & F	N	Agri.	Agri.	D	
b. Middle Swamp	S; W & F	N	Agri.	Agri.	D	
2. Raynor Swamp	S; W & F	N	Agri.	Agri.	D	
a. Harrell Swamp	S; W & F	N	Agri.	Agri.	D	
K. Trotman Creek	PL; S; W & F	N	Fishing	Fishing	C	
1. Walton Pond	S; W & F	N	Fishing	Fishing	C	
2. Warwick Creek	S; W & F	N	Fishing	Fishing	C	
L. Keel Creek (Currituck Creek)	S	N	Fishing	Fishing	C	
1. Mare Branch	S	N	Fishing	Fishing	C	
M. Dillard Creek	S; W & F	N	Fishing	Bathing	B	Primary treated D.S. from Chowan High School - Smalls X-Road.
N. Rockyhock Creek	S; W & F	N	Fishing	Bathing	B	
O. Willow Branch	S; W & F	N	Agri.	Agri.	D	
P. Salmon Creek	S; W & F	N	Fishing	Fishing	C	
1. Eastmost Swamp	S; W & F	N	Agri.	Agri.	D	
2. Cricket Swamp	S; W & F	N	Agri.	Agri.	D	
a. Dunmoor Branch	S; W & F	N	Agri.	Agri.	D	
b. Miller Branch	S; W & F	N	Agri.	Agri.	D	

TABLE 6

RECOMMENDED CLASSIFICATIONS

CHOWAN RIVER BASIN

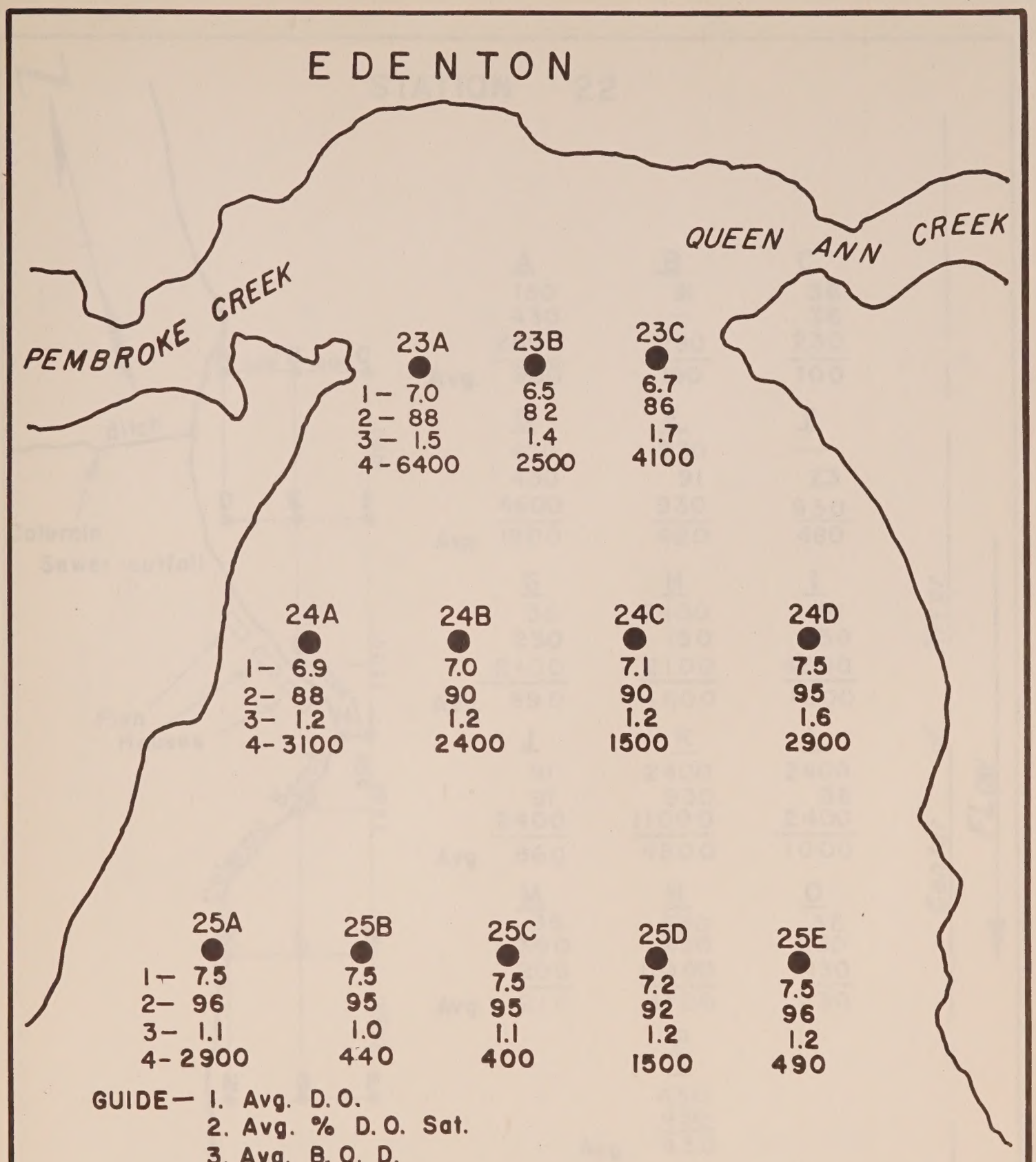
Stream	Character of District	Condition of Waters	Chief Present Usage	Best Usage	Proposed Class	Comments
IV. Section from Mouth of Chowan River, including Edenton Bay and adjacent waters, to a line extending from Mouth of Blackwalnut Creek to north end of Norfolk - Southern Railroad Albemarle Sound Bridge.	PA; S; W & F	SP	Fishing	Fishing	C	
A. Edenton Bay	PA	SP	Fishing	Fishing	C	Untreated D.S. from Edenton, N. C.
1. Pembroke Creek	S; PA	SP	Fishing	Fishing	C	Untreated D.S. from Westover Heights & I.W. from Holland & Spivey Veneer Mill.
a. Pollock Swamp	S; W & F	N	Agri.	Agri.	D	
2. Queen Anne Creek	S; PA	SP	Fishing	Fishing	C	Untreated D.S. from Edenton.
B. Blackwalnut Swamp	W & F	N	Fishing	Fishing	C	
Chowan River - Bathing Areas						
A. Colerain Beach - Defined as follows: Area within a line beginning on the west side of Chowan River at the terminus of N. C. Hwy. 350, running due north along the shoreline for 1,000 feet to a point on the west river bank; thence in a straight line running due east to a point on Bertie-Chowan County line located in the middle of Chowan River; thence in a southerly direction along the Bertie-Chowan County line to a point located 2,000 feet downstream; thence in a straight line running due west to a point located on the west bank of Chowan River; thence in a northerly direction along shoreline to the point of beginning.					B	

TABLE 6

RECOMMENDED CLASSIFICATIONS

CHOWAN RIVER BASIN

Stream	Character of District	Condition of Waters	Chief Present Usage	Best Usage	Proposed Class	Comments
B. Mount Gould Beach - Defined as follows: Area within a line beginning on the west side of Chowan River at the terminus of county dirt road from Mount Gould, running due north along the shoreline for 1,000 feet to a point on the west river bank; thence in a straight line running due east to a point on Bertie-Chowan County line located in the middle of Chowan River; thence in a southerly direction along the Bertie-Chowan County Line to a point located 2,000 feet downstream; thence in a straight line running due west to a point located on the west bank of Chowan River; thence in a northerly direction along shoreline to the point of beginning.					B	
C. Edenhouse Beach - Defined as follows: Area within a line beginning at the west end of U. S. Hwy. #17 Chowan River Bridge, running in an easterly direction along U. S. Hwy. #17 Bridge to a point on the Bertie-Chowan County Line located in the middle of Chowan River; thence in a southerly direction along the Bertie-Chowan County Line to a point located 2,000 feet downstream; thence in a straight line due west to a point located on west bank of Chowan River; thence in a northerly direction along shoreline to the point of beginning.					B	

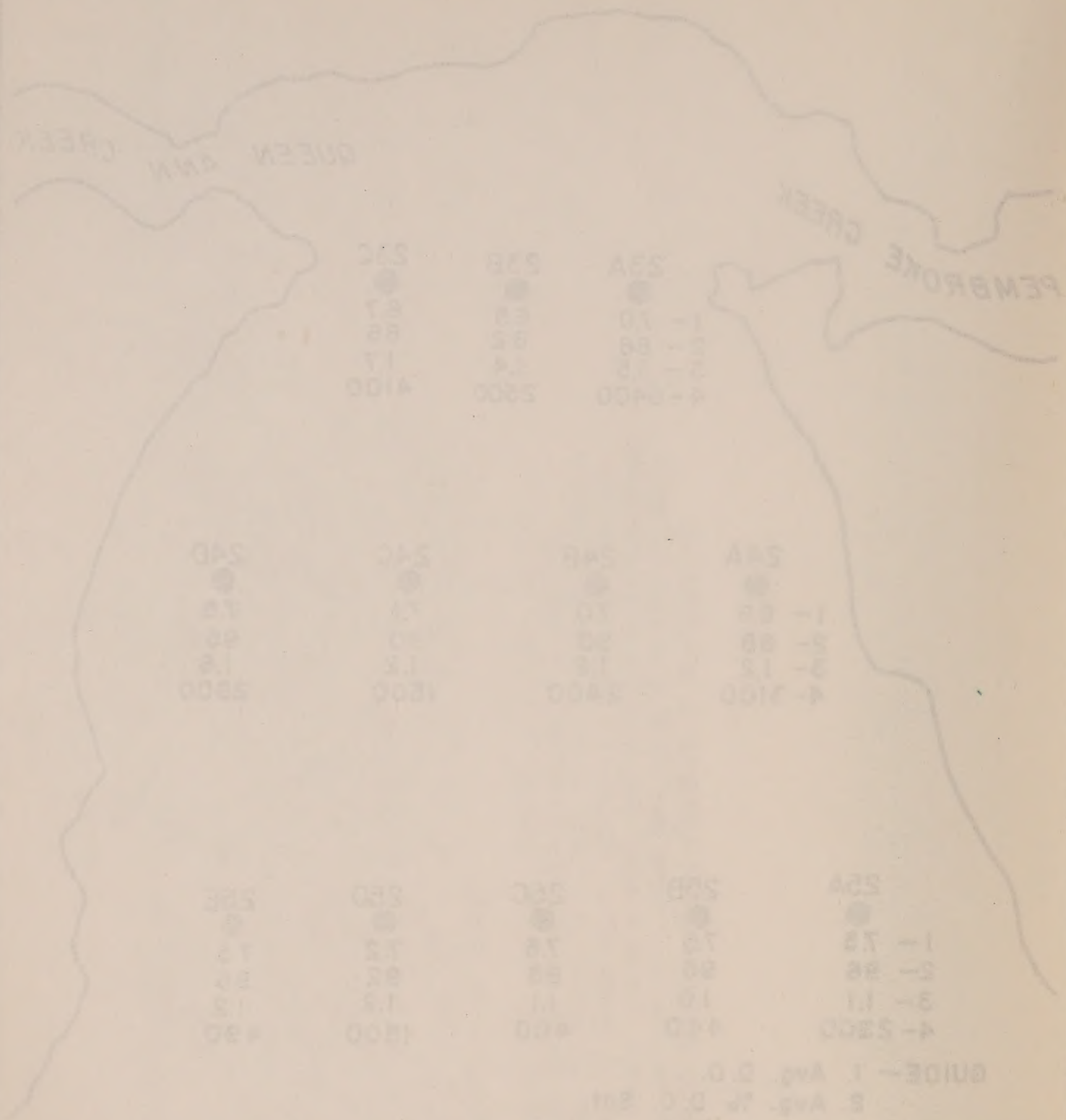


STATIONS 23, 24, 25

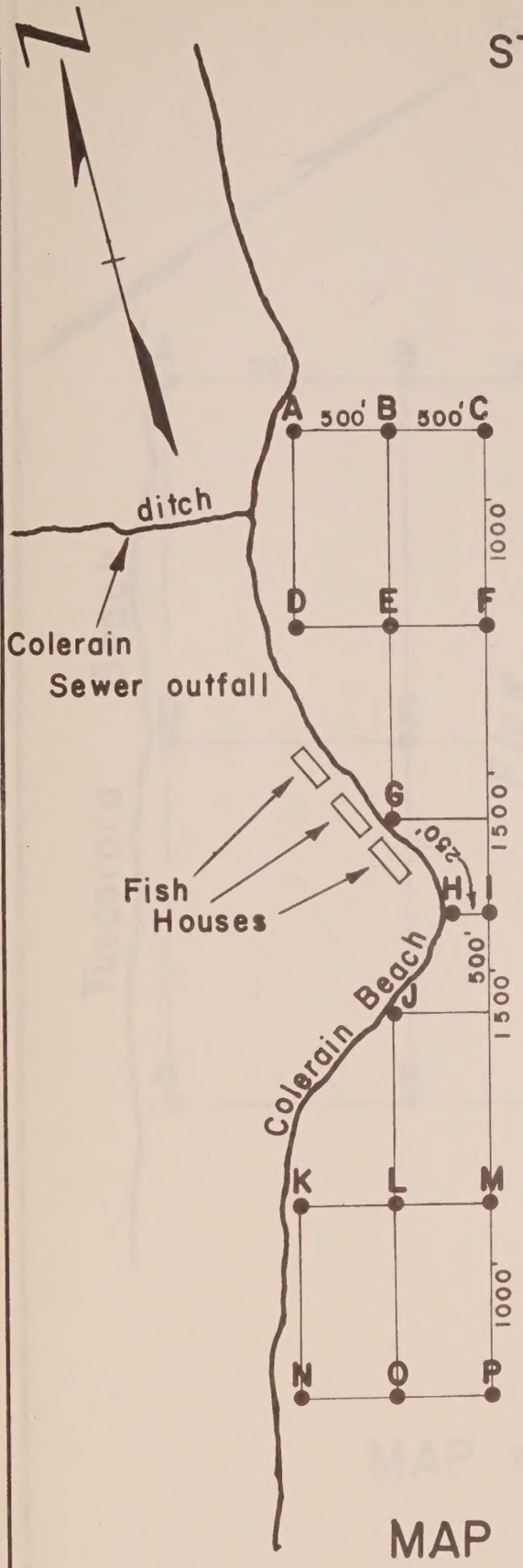
MAP OF EDENTON BAY

SHOWING

AVERAGE ANALYTICAL RESULTS



STATION 22



	A	B	C
	150	91	36
	430	—	36
	2400	280	230
Avg.	990	190	100

	D	E	F
	430	230	—
	430	91	23
	4600	930	930
Avg.	1800	420	480

	G	H	I
	36	2400	91
	230	150	230
	2400	2100	4600
Avg.	890	1600	1600

	J	K	L
	91	2400	2400
	91	930	36
	2400	11000	2400
Avg.	860	4800	1600

	M	N	O
	36	230	36
	390	930	230
	200	11000	430
Avg.	210	4100	230

	P
	—
	430
	430
Avg.	430

Center of River FLOW

MAP of COLERAIN BEACH
(CHOWAN RIVER)

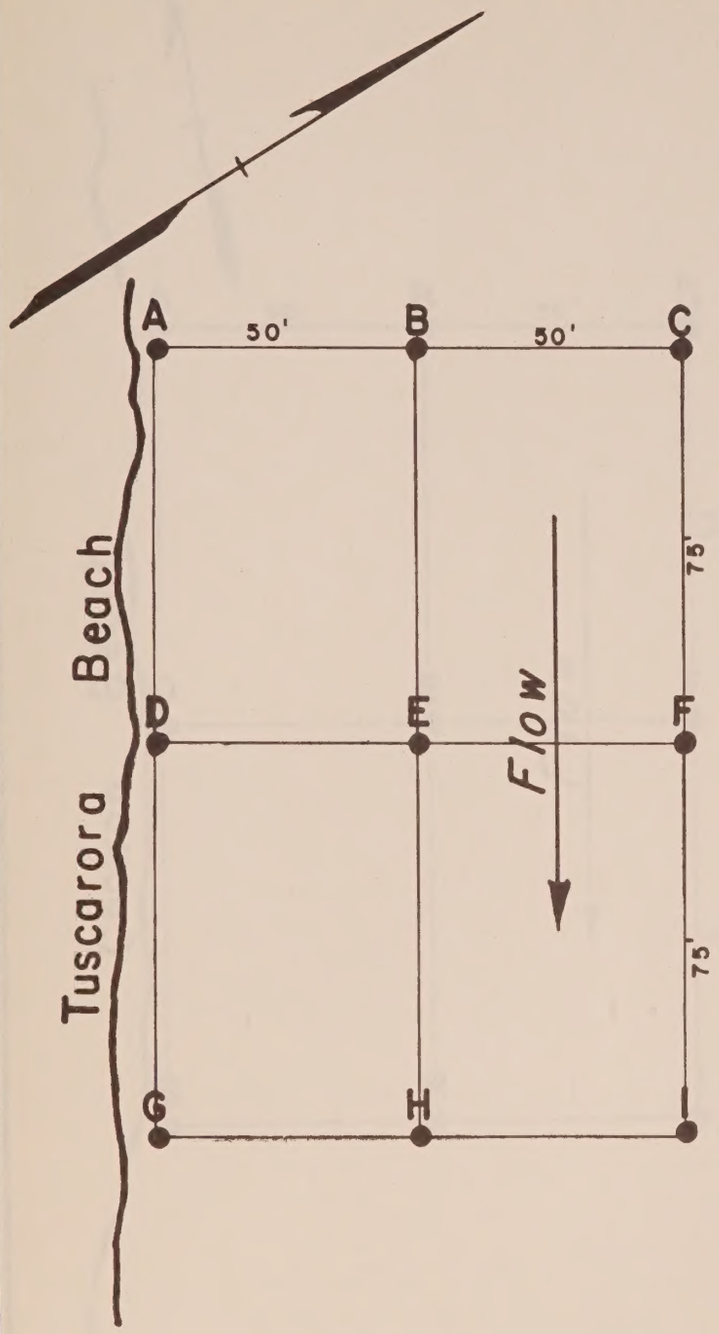
SHOWING

COLIFORM SAMPLING POINTS

AND

MPN VALUES

STATION 26



	A	B	C
	—	30	36
	430	230	150
	430	150	430
Avg.	430	140	200

	D	E	F
	4600	91	30
	230	430	—
	2400	240	240
Avg.	2400	250	140

	G	H	I
	91	36	—
	30	36	91
	930	930	930
Avg.	350	330	510

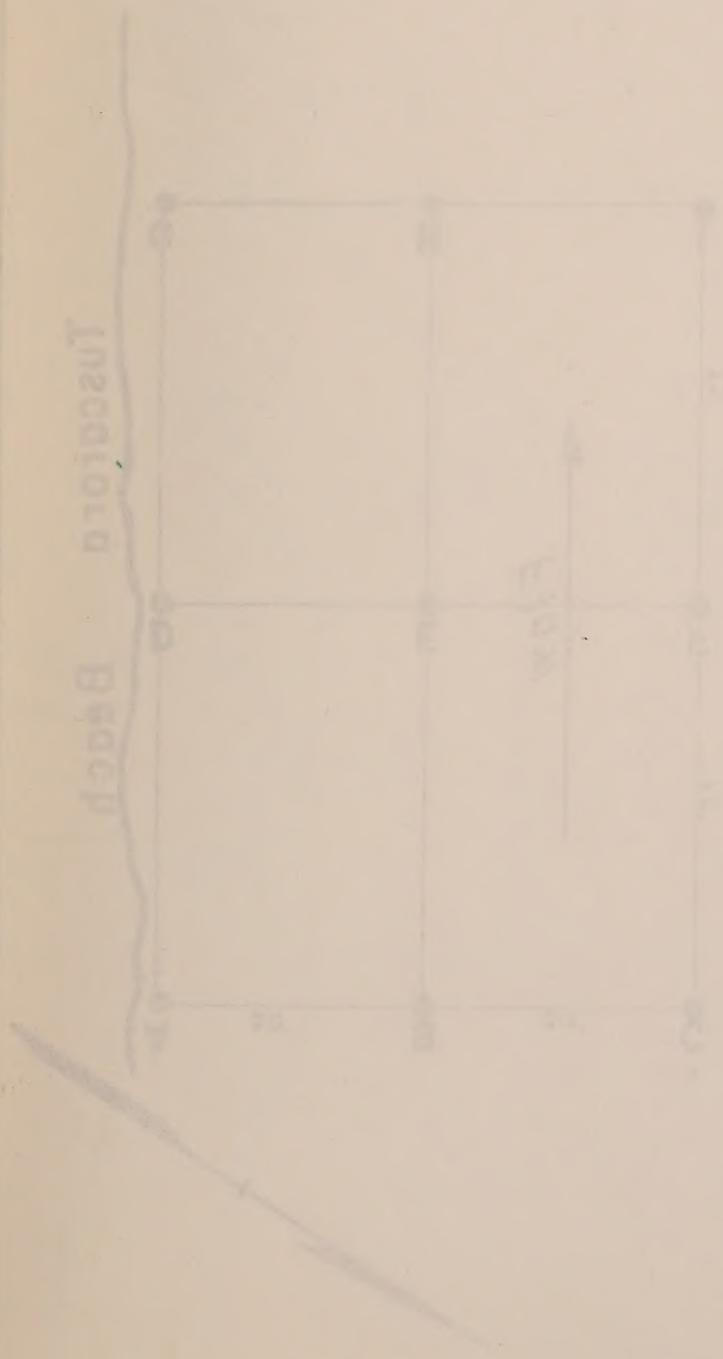
MAP of TUSCARORA BEACH
(CHOWAN RIVER)

SHOWING

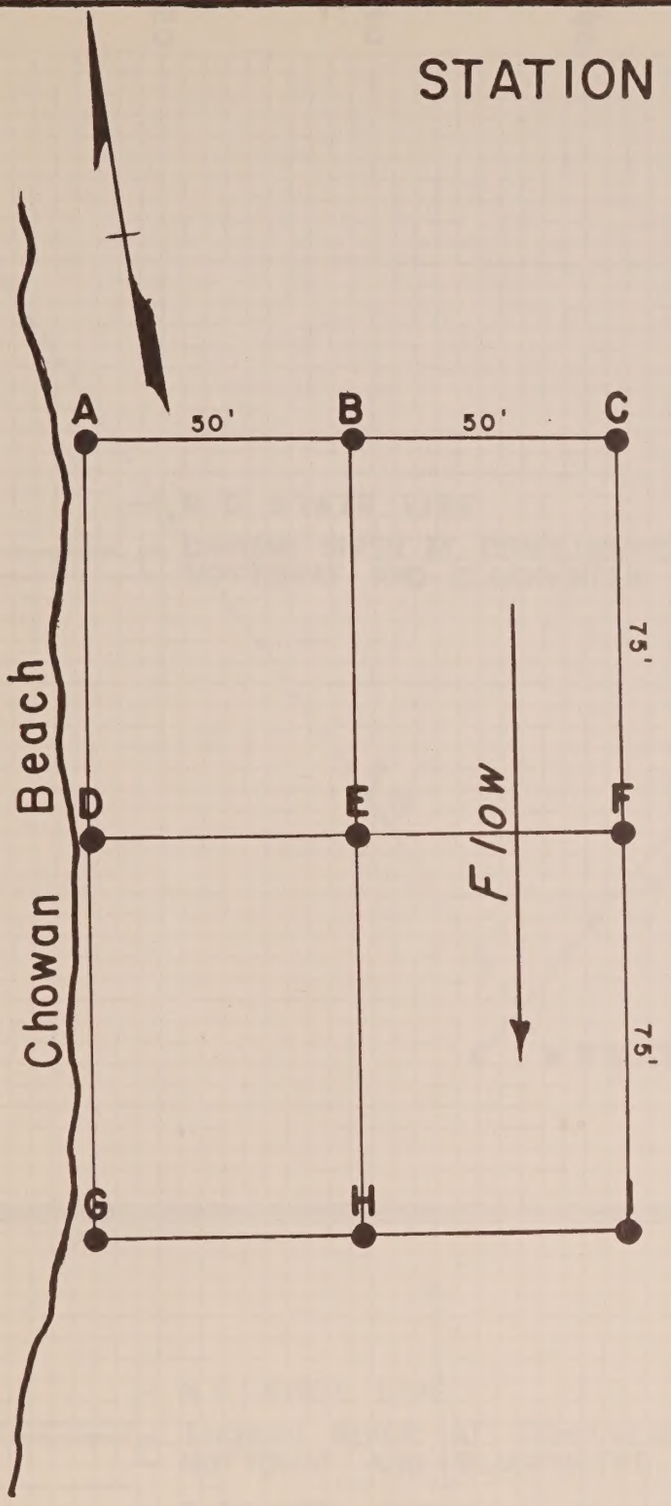
COLIFORM SAMPLING POINTS

AND

MPN VALUES



STATION 28



A	B	C	
140	150	—	
930	91	230	
2400	430	210	
1200	220	220	Avg.

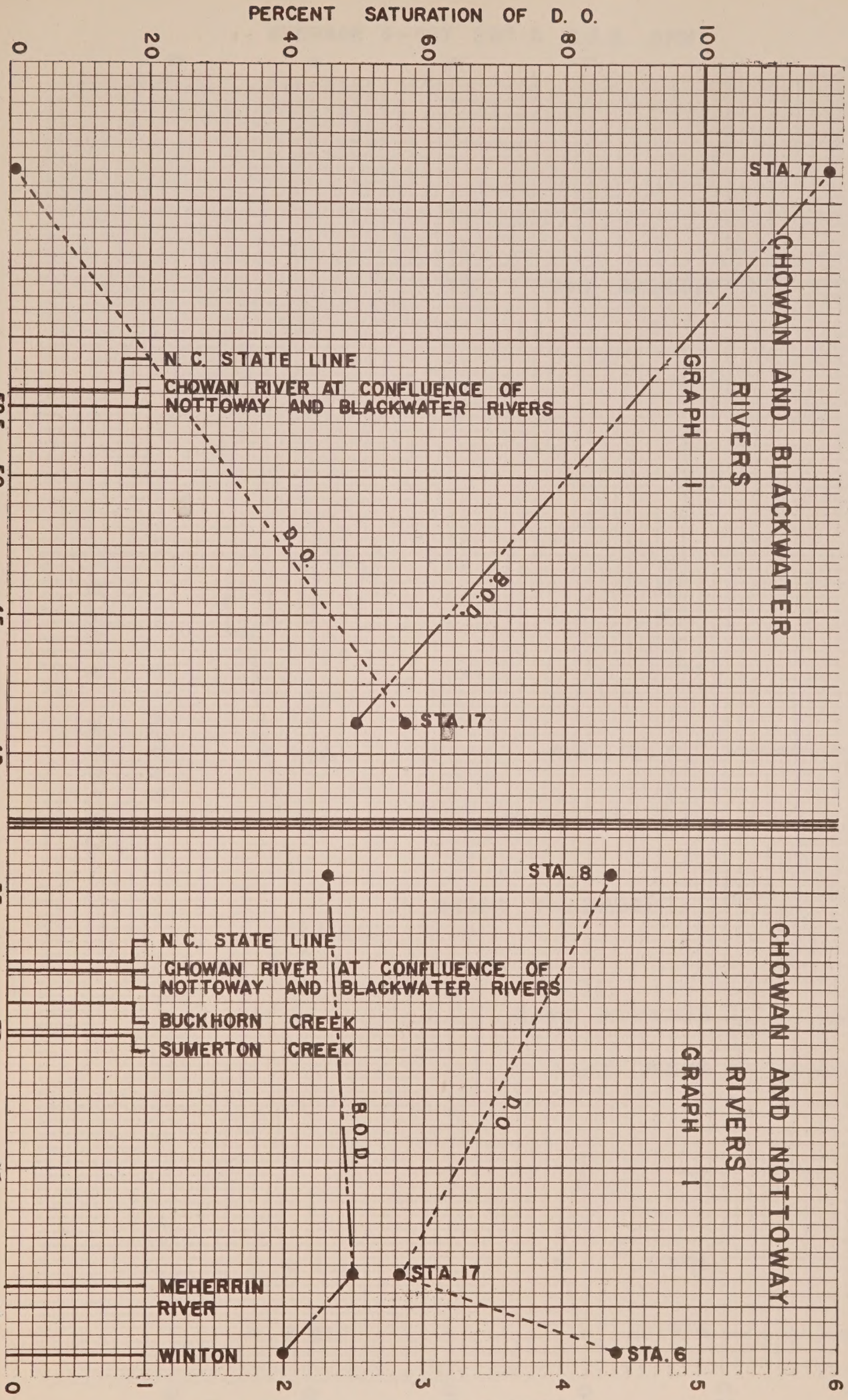
D	E	F	
750	36	150	
230	430	390	
430	140	930	
470	200	490	Avg.

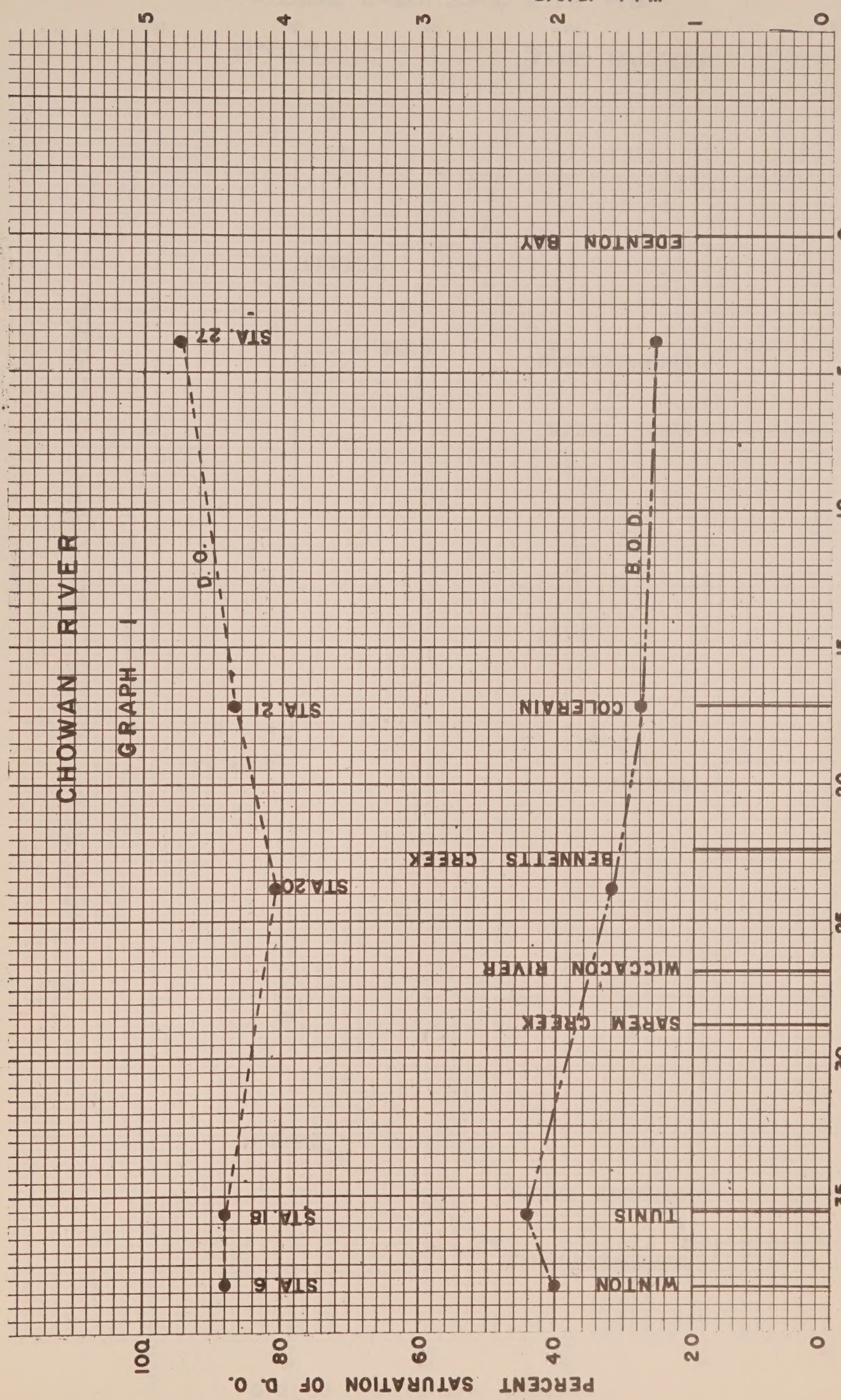
G	H	I	
1500	91	36	
230	430	210	
230	2400	110	
650	970	120	Avg.

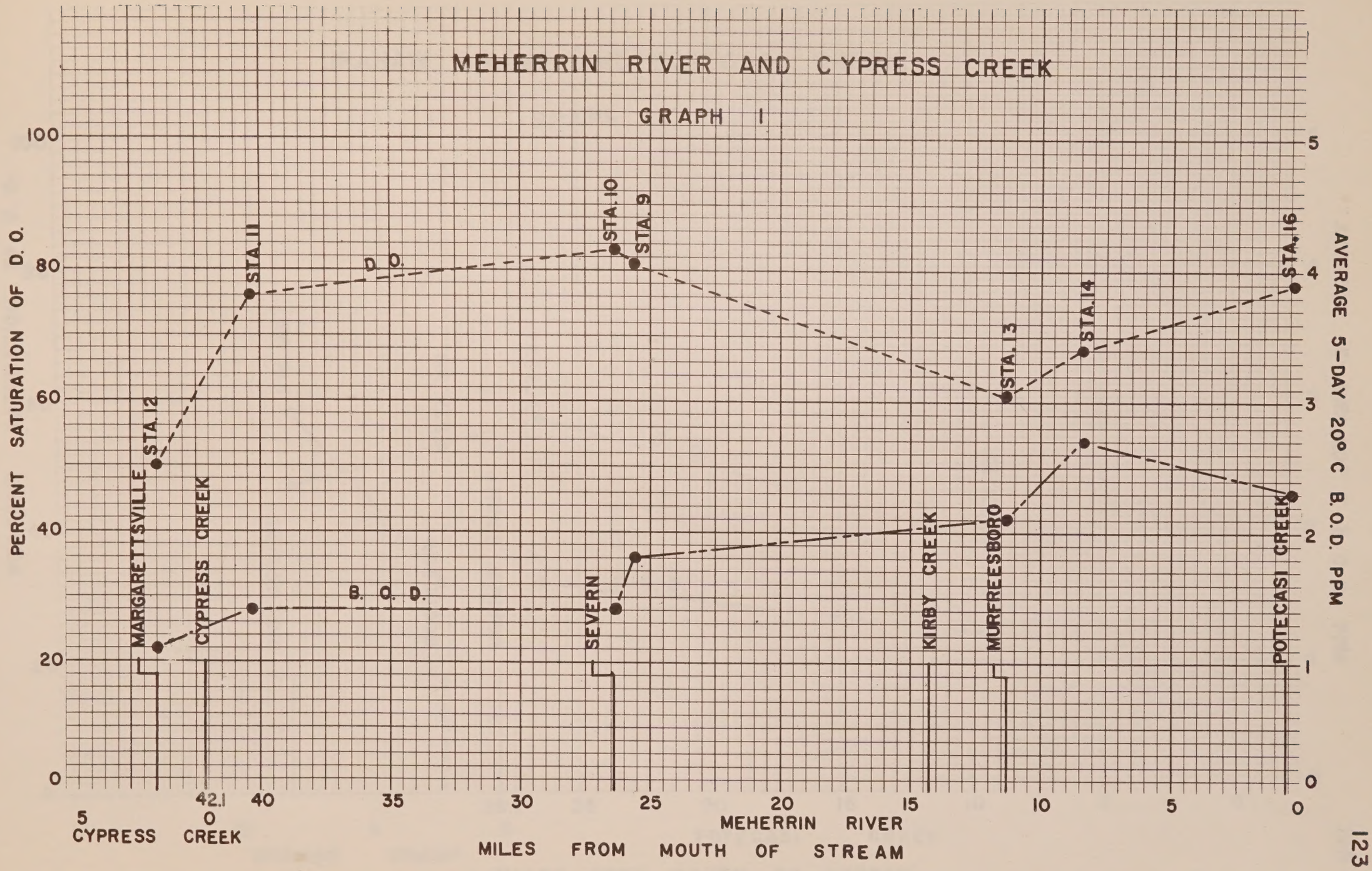
MAP of CHOWAN BEACH
(CHOWAN RIVER)
SHOWING

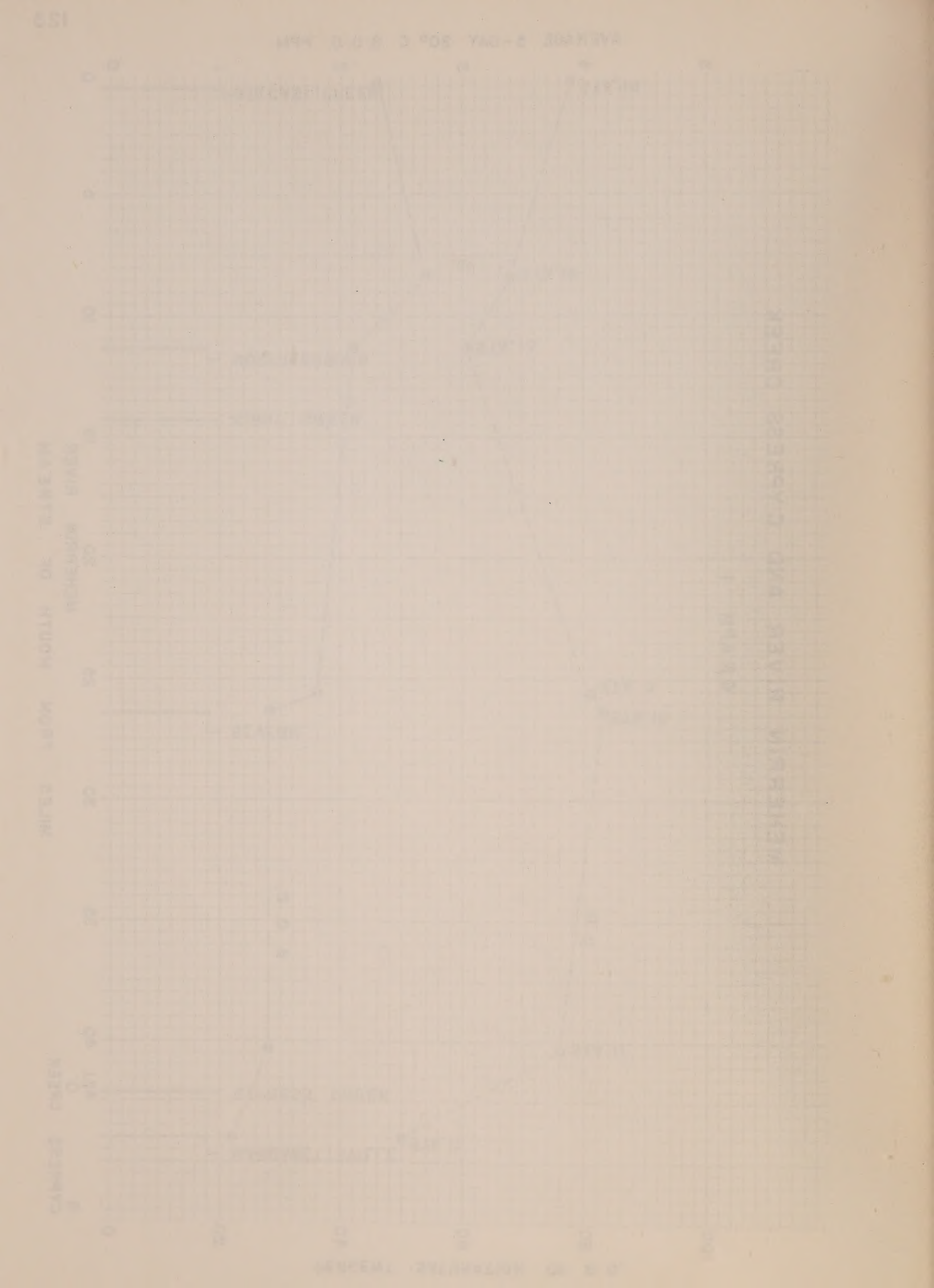
COLIFORM SAMPLING POINTS
AND

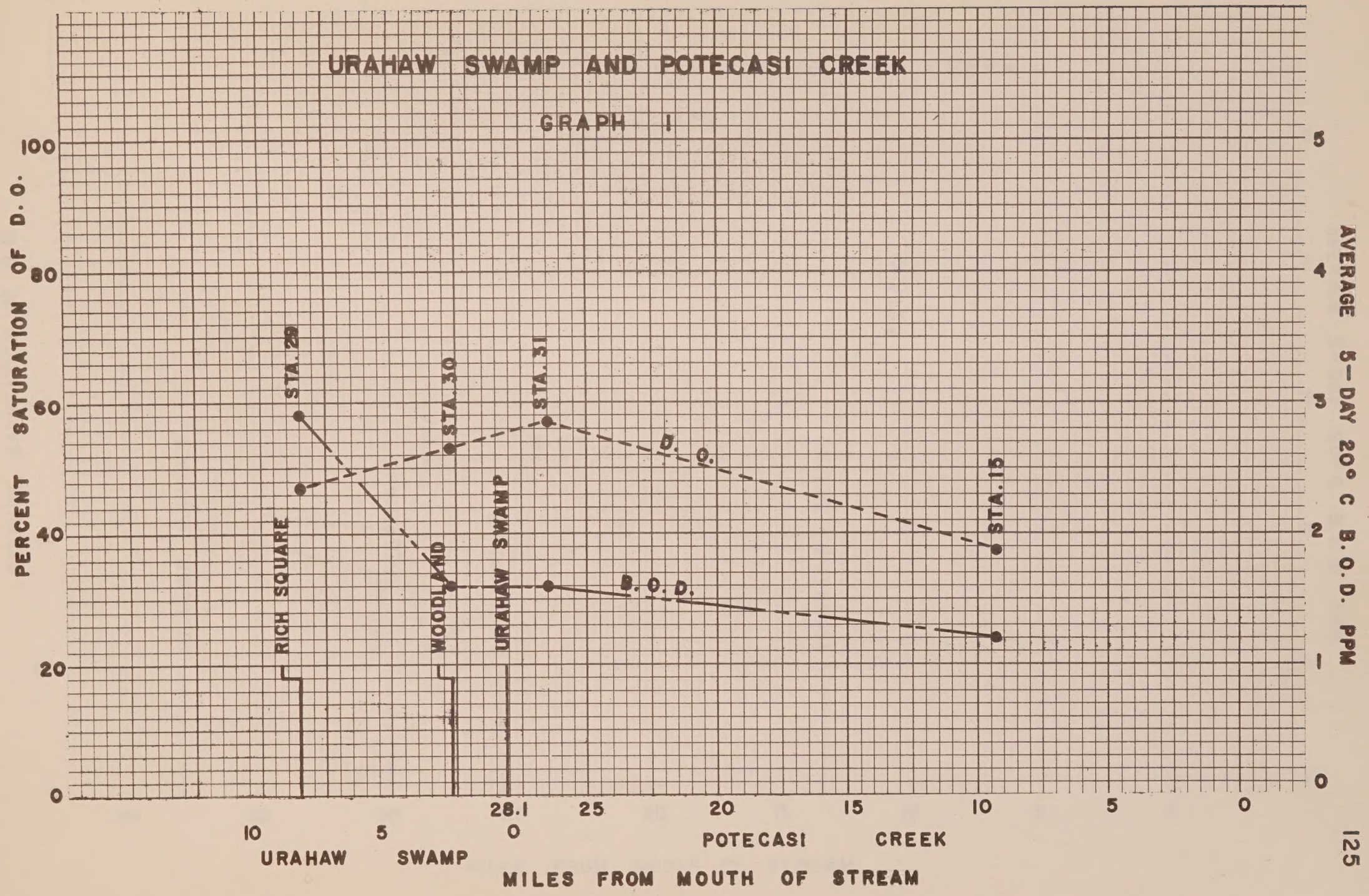
MPN VALUES

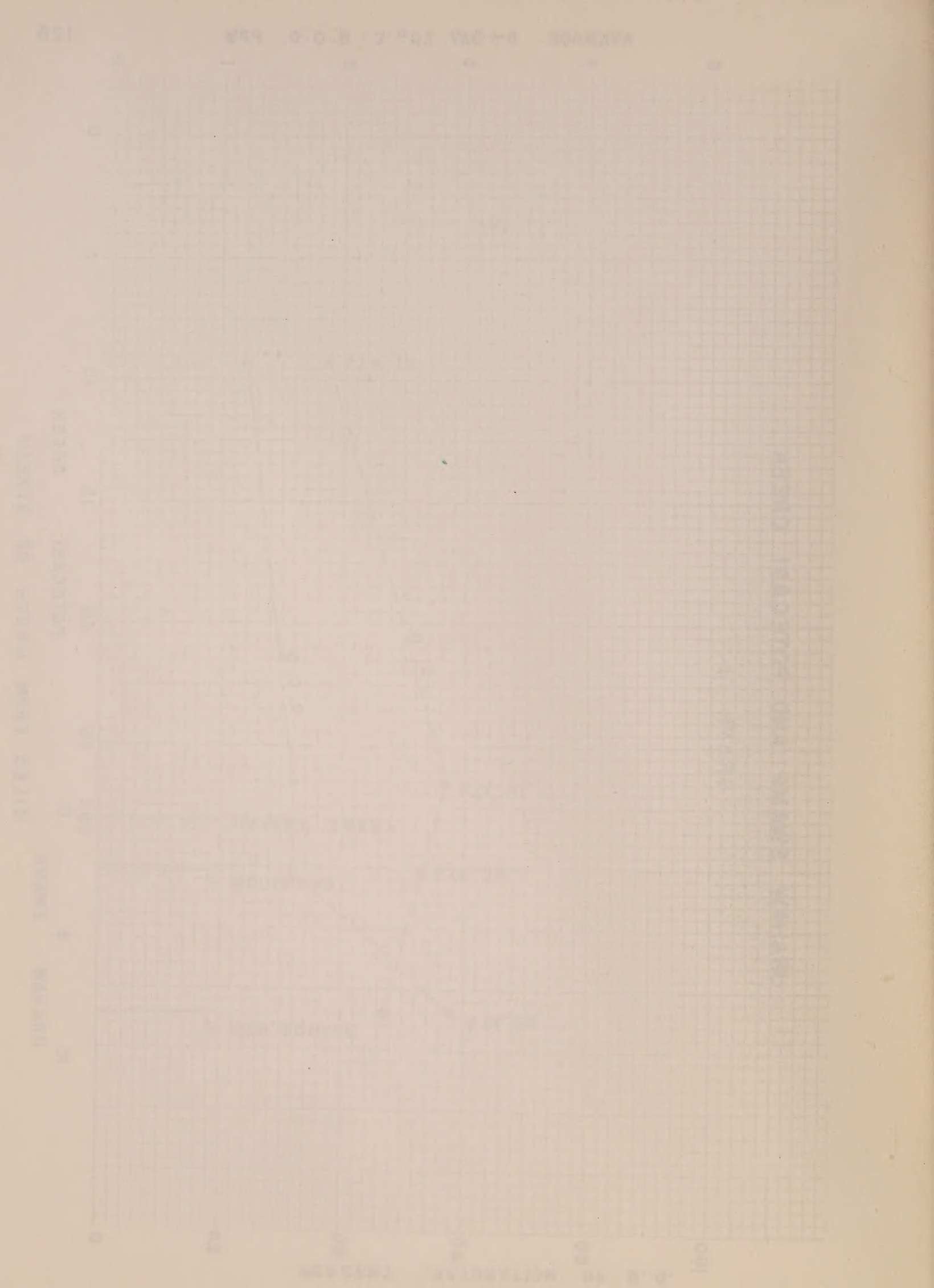

PERCENT SATURATION OF D. O.
0
20
40
60
80
100
STA. 7
CHOWAN AND BLACKWATER RIVERS
GRAPH I
N. C. STATE LINE
CHOWAN RIVER AT CONFLUENCE OF NOTTOWAY AND BLACKWATER RIVERS
D.O.
B.O.D.
STA. 17
STA. 8
CHOWAN AND NOTTOWAY RIVERS
GRAPH I
N. C. STATE LINE
CHOWAN RIVER AT CONFLUENCE OF NOTTOWAY AND BLACKWATER RIVERS
BUCKHORN CREEK
SUMERTON CREEK
B.O.D.
D.O.
STA. 17
MEHERRIN RIVER
WINTON
STA. 6
BLACKWATER RIVER
CHOWAN RIVER
MILES FROM MOUTH OF STREAM
AVERAGE 5-DAY 20°C B. O. D. PPM

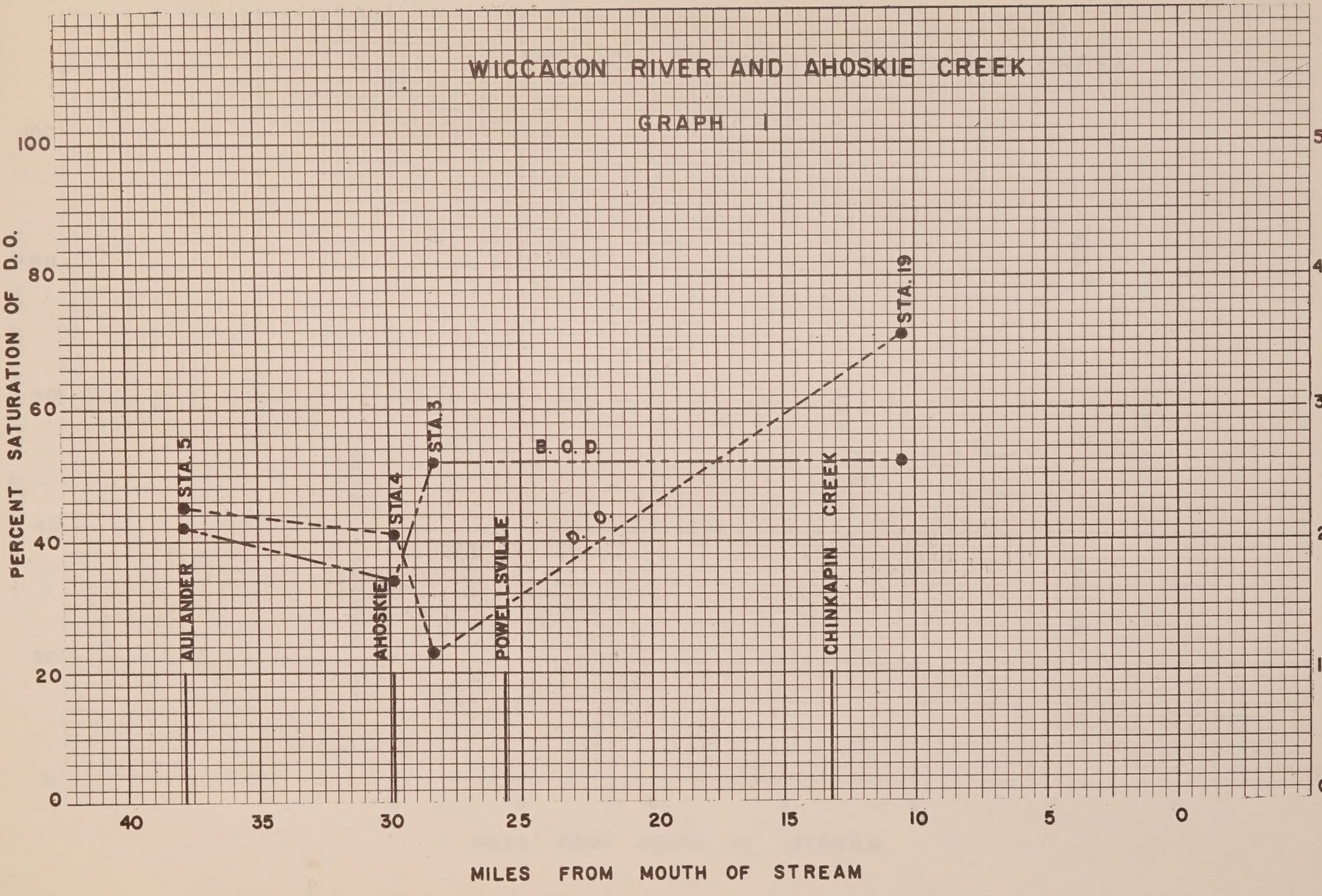

AVERAGE 5-DAY 20° C B.O.D. PPM
5
4
3
2
1
0
CHOWAN RIVER
GRAPH I
D.O.
B.O.D.
STA. 27
STA. 21
STA. 20
STA. 18
STA. 6
EDENTON BAY
COLERAIN
BENNETTS CREEK
MICCACON RIVER
SAREM CREEK
TUNIS
WINTON
MILES FROM MOUTH OF STREAM
0
5
10
15
20
25
30
35
PERCENT SATURATION OF D. O.
100
80
60
40
20
0

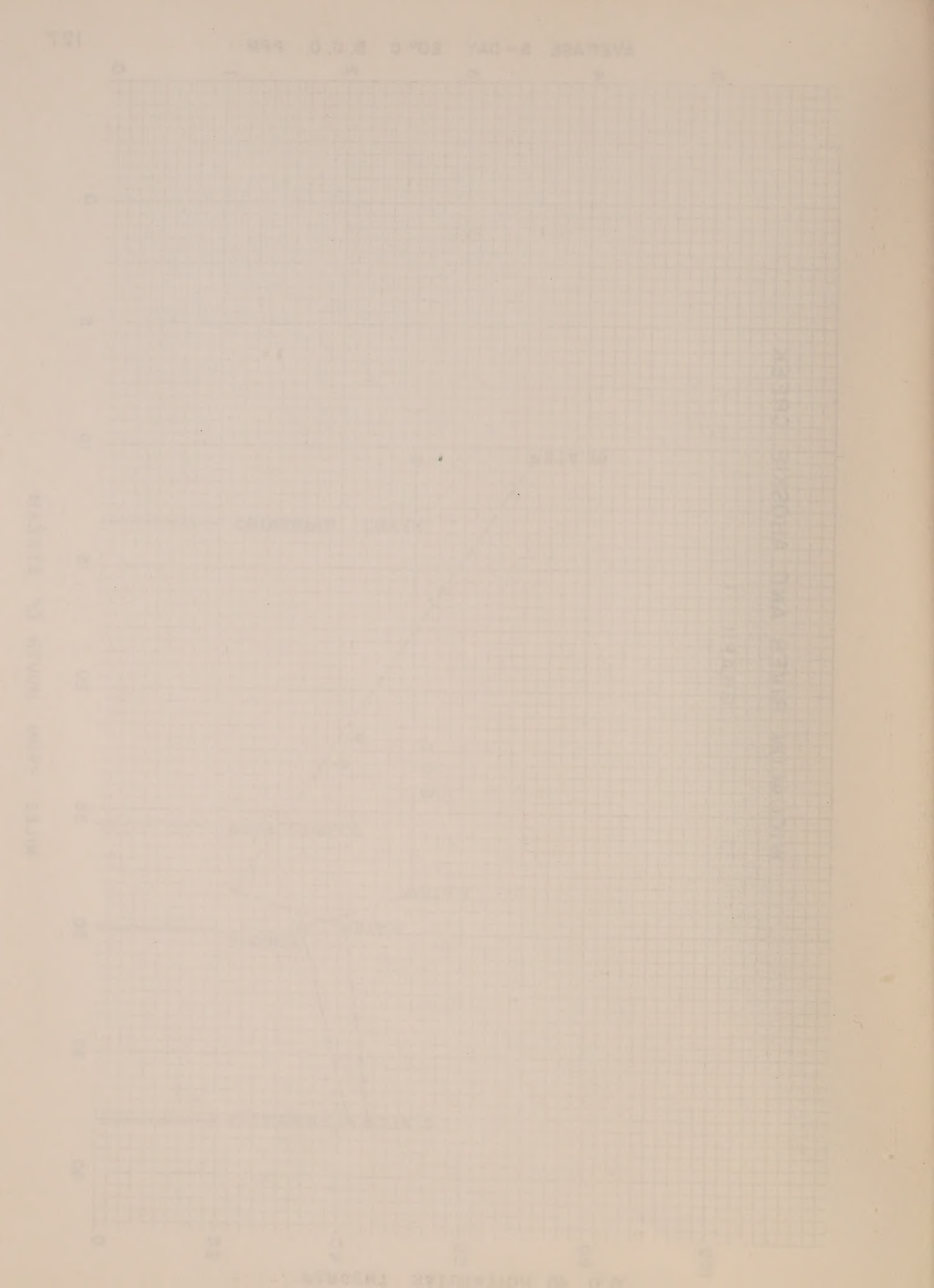

MEHERRIN RIVER AND CYPRESS CREEK
GRAPH 1
PERCENT SATURATION OF D. O.
AVERAGE 5-DAY 20° C B.O.D. PPM
D. O.
B. O. D.
STA. 12
STA. 11
STA. 10
STA. 9
STA. 13
STA. 14
STA. 15
MARGARETTSVILLE
CYPRESS CREEK
SEVERN
KIRBY CREEK
MURFREESBORO
POTECASI CREEK
100
80
60
40
20
0
5
4
3
2
1
0
42.1
40
35
30
25
20
15
10
5
0
5
CYPRESS CREEK
0
MEHERRIN RIVER
MILES FROM MOUTH OF STREAM

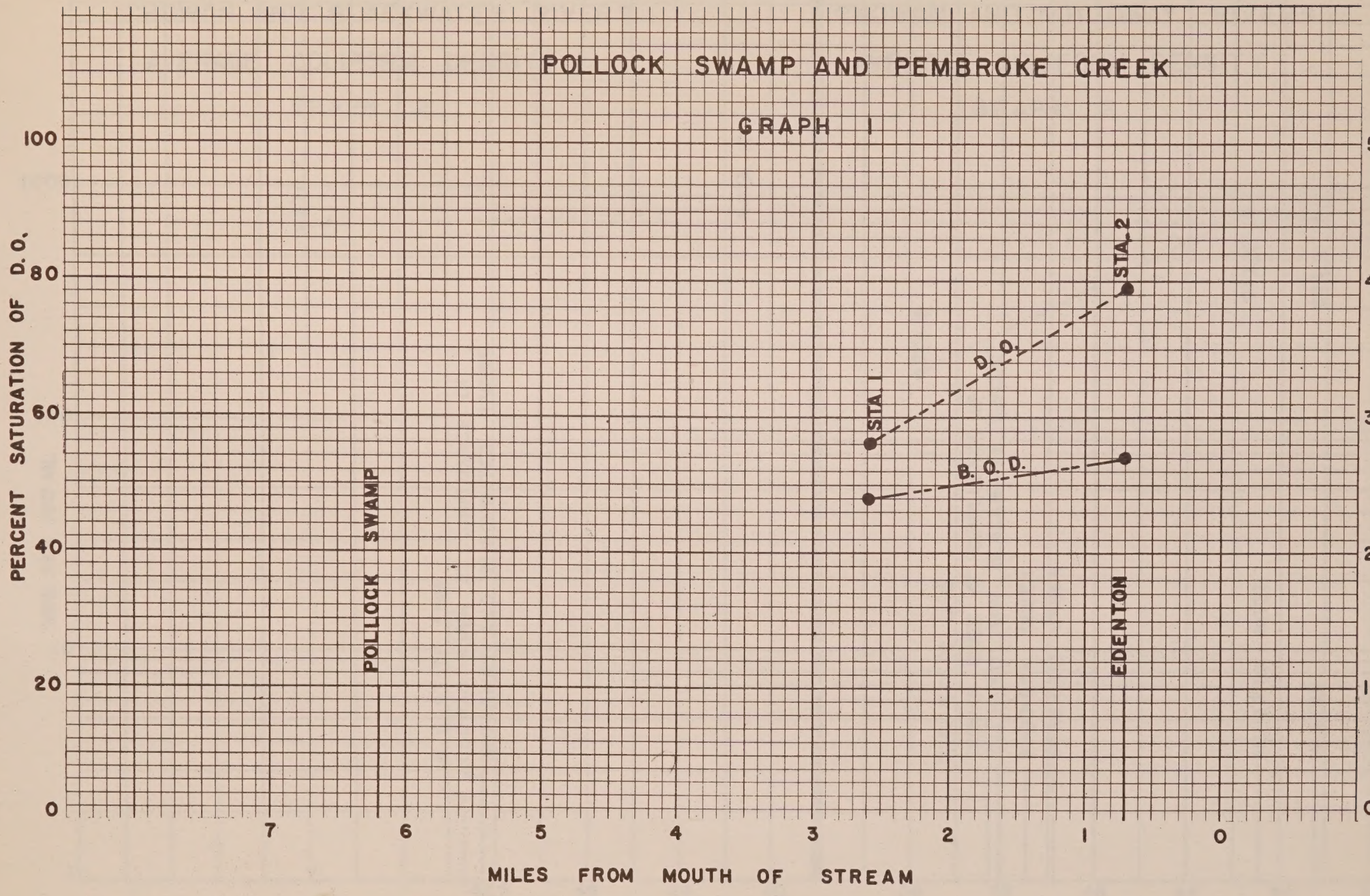


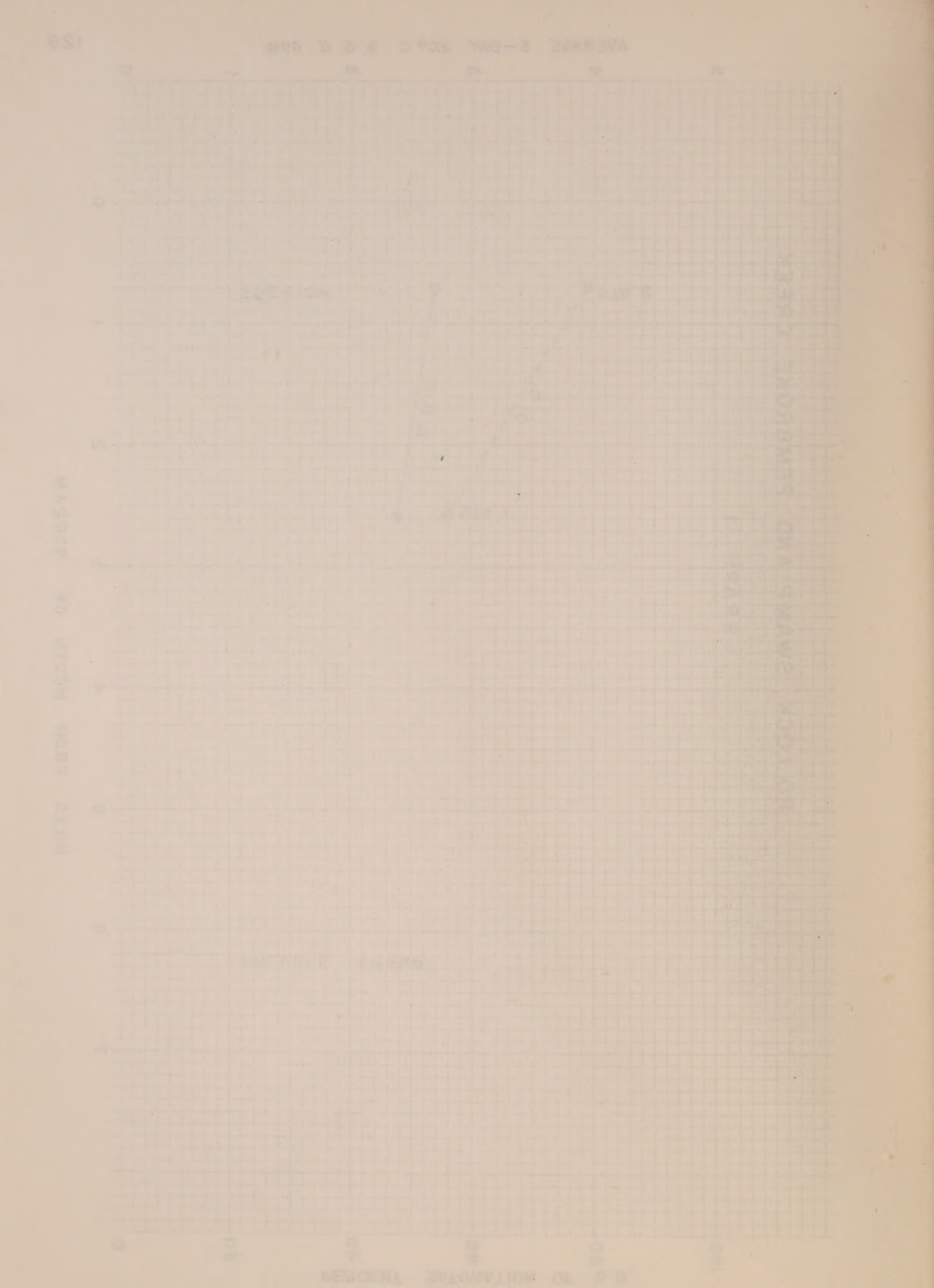

URAHAW SWAMP AND POTECASI CREEK
GRAPH 1
PERCENT SATURATION OF D.O.
AVERAGE 5-DAY 20° C B.O.D. PPM
100
80
60
40
20
0
5
4
3
2
1
0
STA. 29
STA. 30
STA. 31
STA. 15
D. O.
B. O. D.
RICH SQUARE
WOODLAND
URAHAW SWAMP
28.1
25
20
15
10
5
0
10
5
0
URAHAW SWAMP
POTECASI CREEK
MILES FROM MOUTH OF STREAM

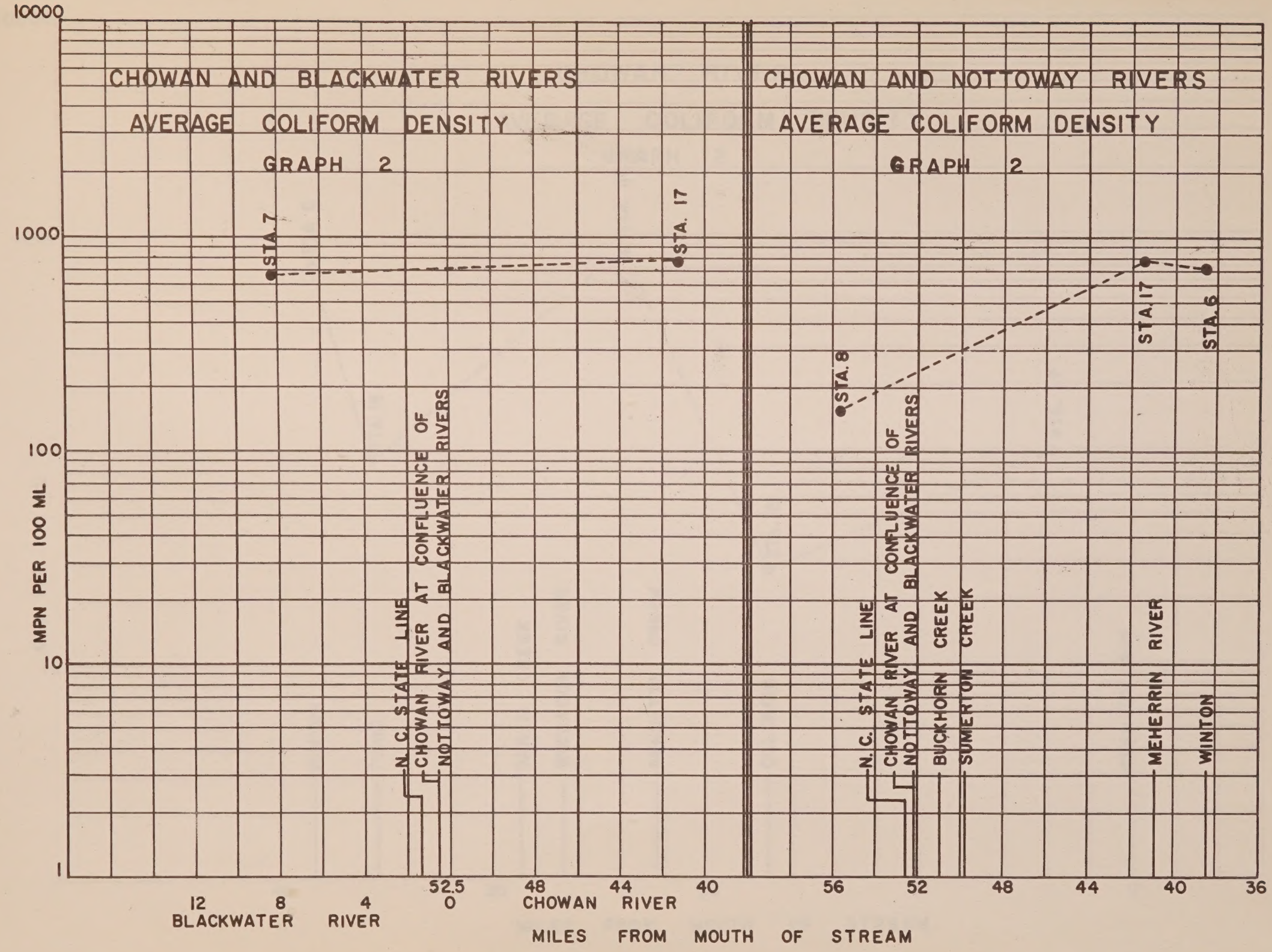


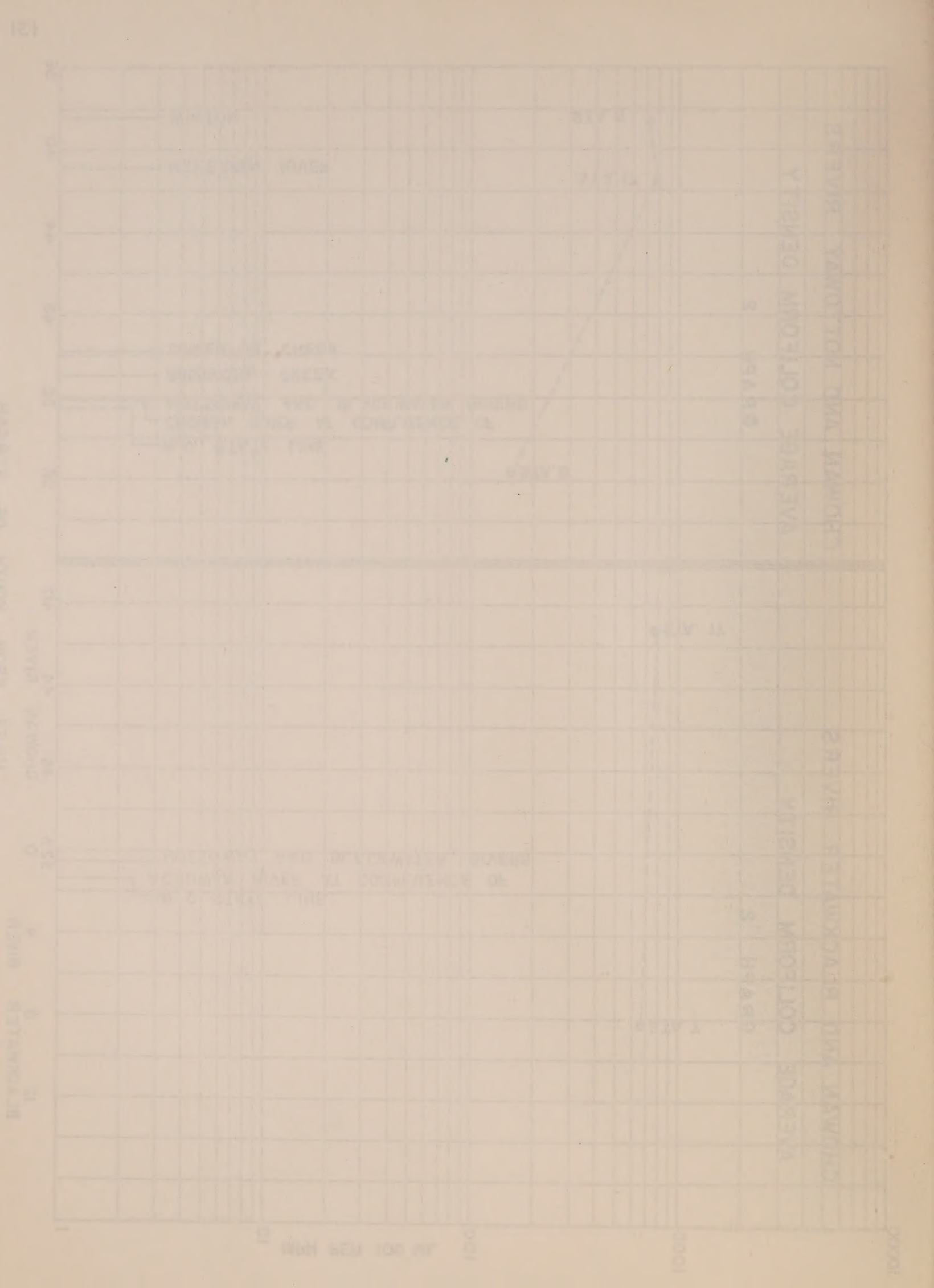

WICCACON RIVER AND AHOSKIE CREEK
GRAPH 1
PERCENT SATURATION OF D.O.
AVERAGE 5-DAY 20° C B.O.D. PPM
MILES FROM MOUTH OF STREAM
100
80
60
40
20
0
5
4
3
2
1
0
40
35
30
25
20
15
10
5
0
STA. 5
STA. 4
STA. 3
STA. 19
B.O.D.
D.O.
AULANDER
AHOSKIE
POWELLSVILLE
CHINKAPIN CREEK

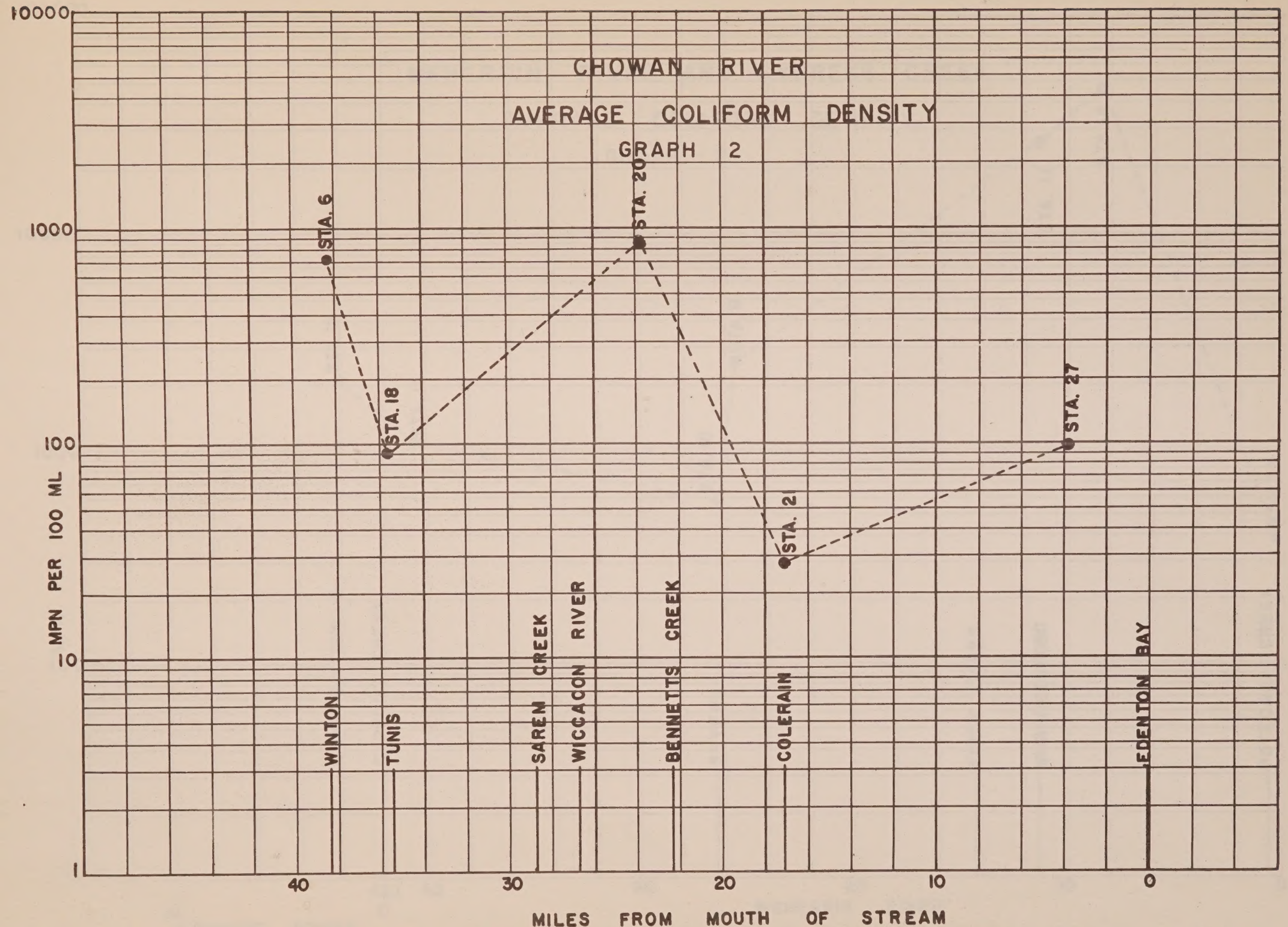


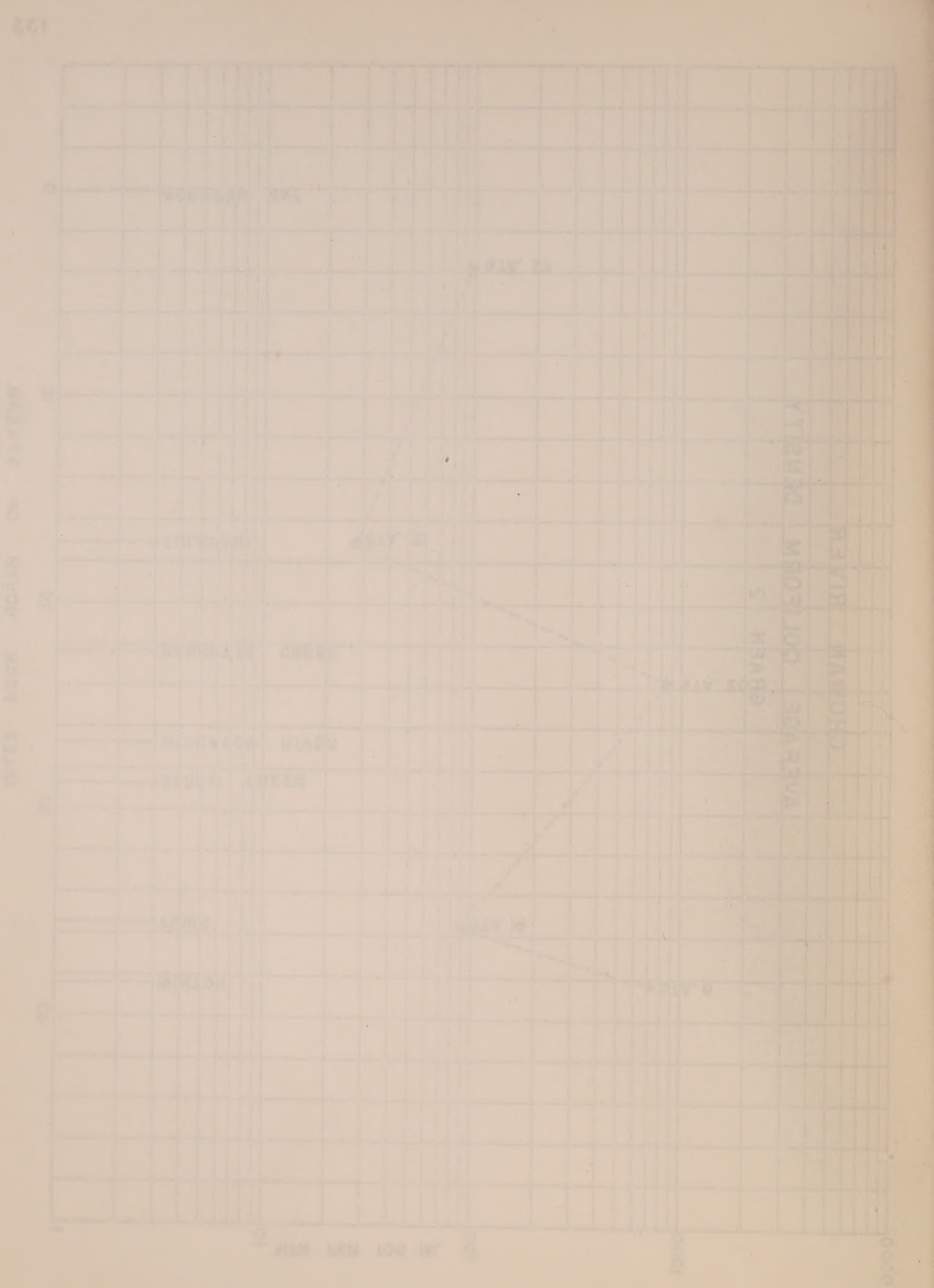

POLLOCK SWAMP AND PEMBROKE CREEK
GRAPH I
PERCENT SATURATION OF D.O.
AVERAGE 5-DAY 20° C B.O.D. PPM
MILES FROM MOUTH OF STREAM
POLLOCK SWAMP
EDENTON
STA 1
STA 2
D.O.
B.O.D.
100
80
60
40
20
0
5
4
3
2
1
0
7
6
5
4
3
2
1
0

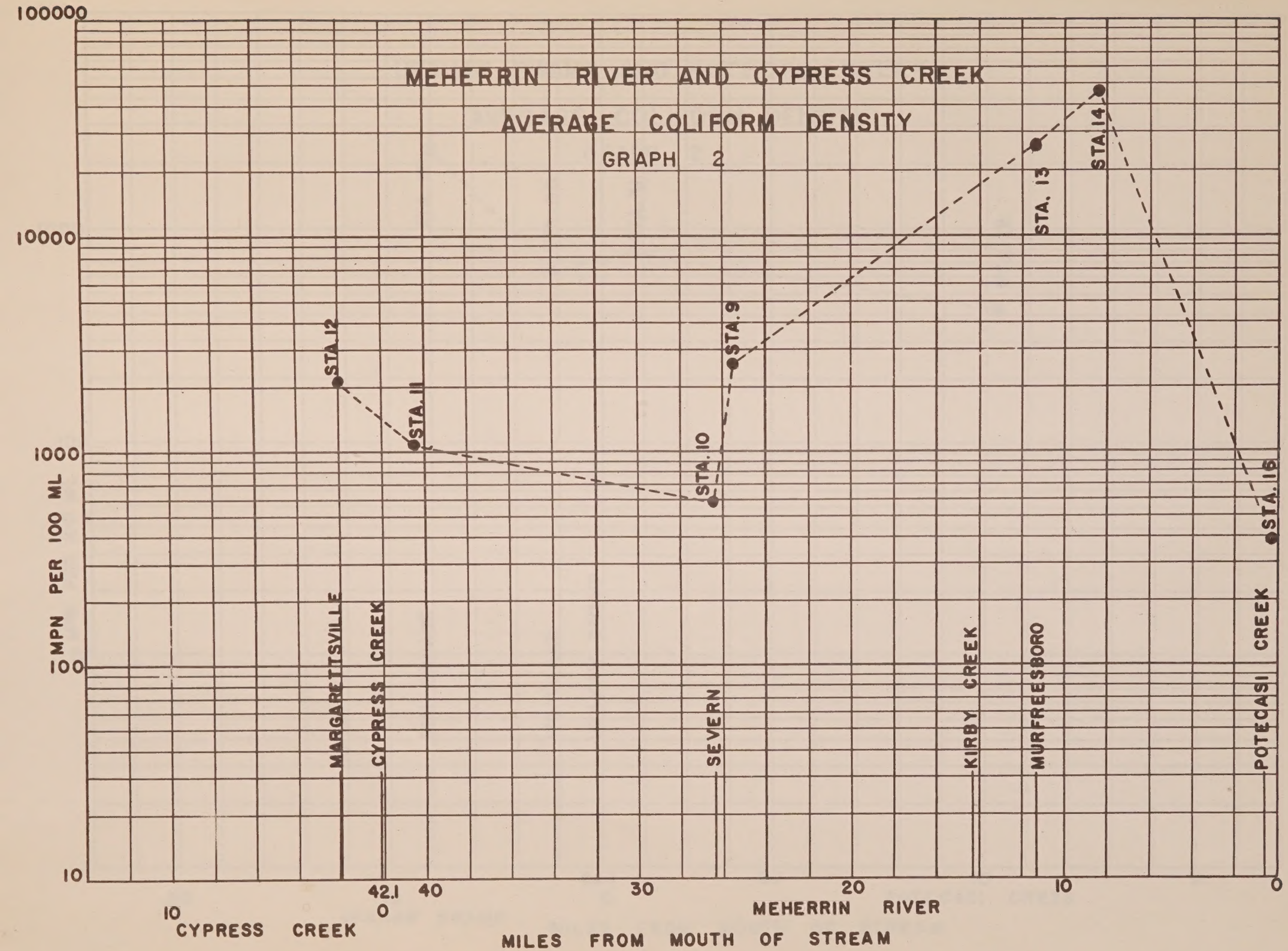


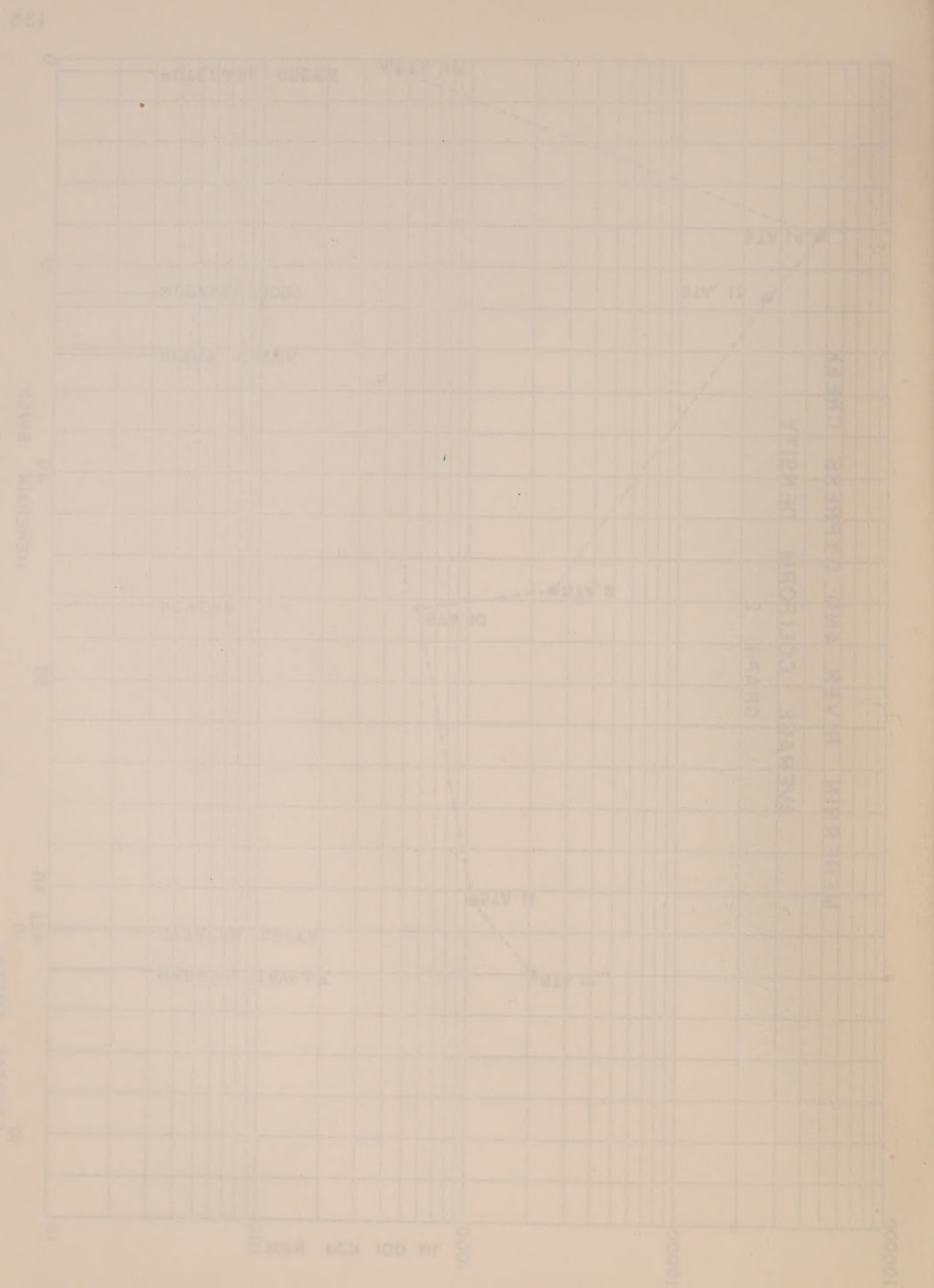

CHOWAN AND BLACKWATER RIVERS
AVERAGE COLIFORM DENSITY
GRAPH 2
CHOWAN AND NOTTOWAY RIVERS
AVERAGE COLIFORM DENSITY
GRAPH 2
MPN PER 100 ML
10000
1000
100
10
1
STA. 7
STA. 17
STA. 8
STA. 17
STA. 6
N.C. STATE LINE
CHOWAN RIVER AT CONFLUENCE OF NOTTOWAY AND BLACKWATER RIVERS
BUCKHORN CREEK
SUMERTON CREEK
MEHERRIN RIVER
WINTON
12 8 4 52.5 0 48 44 40 56 52 48 44 40 36
BLACKWATER RIVER
CHOWAN RIVER
MILES FROM MOUTH OF STREAM

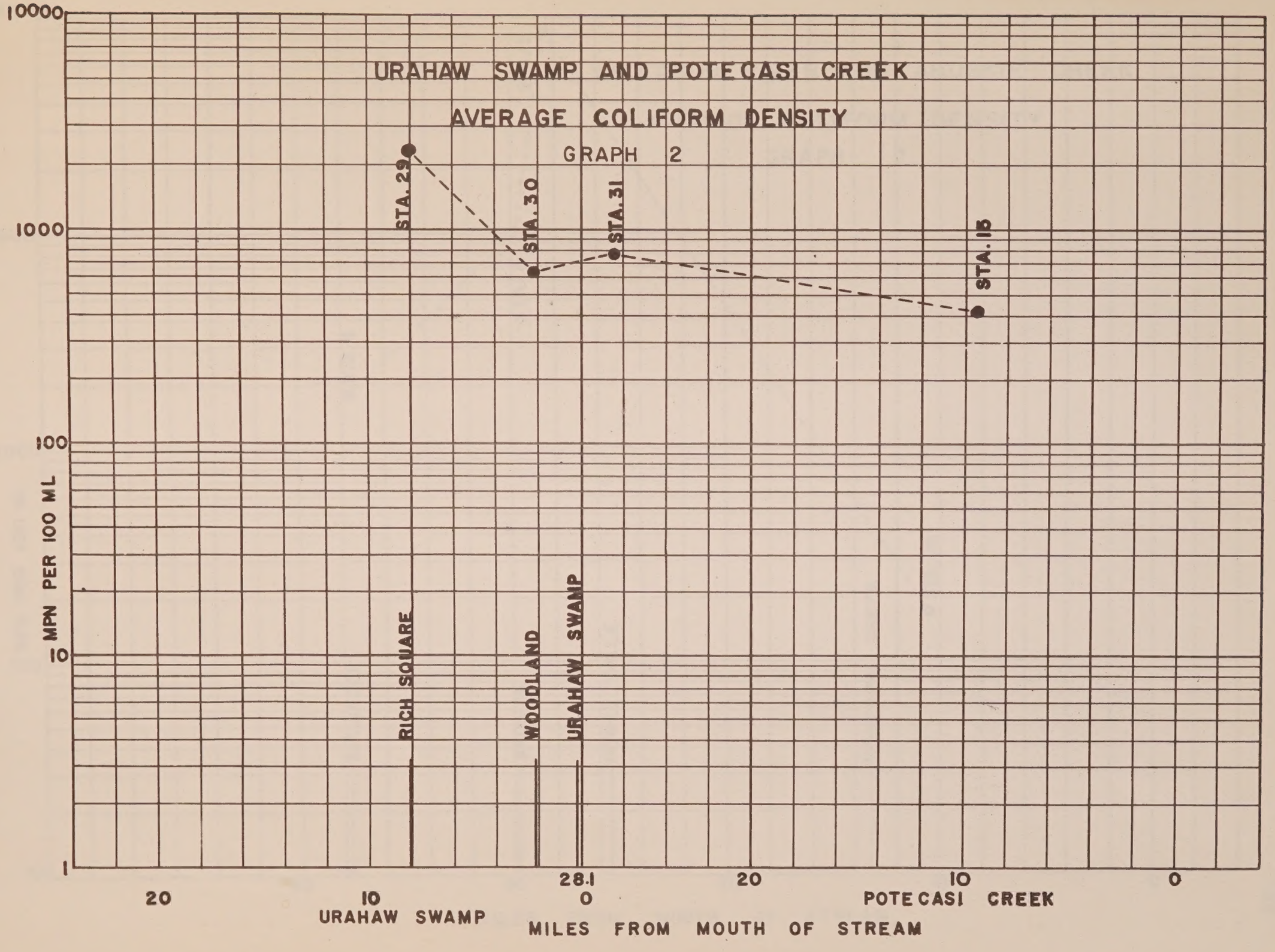


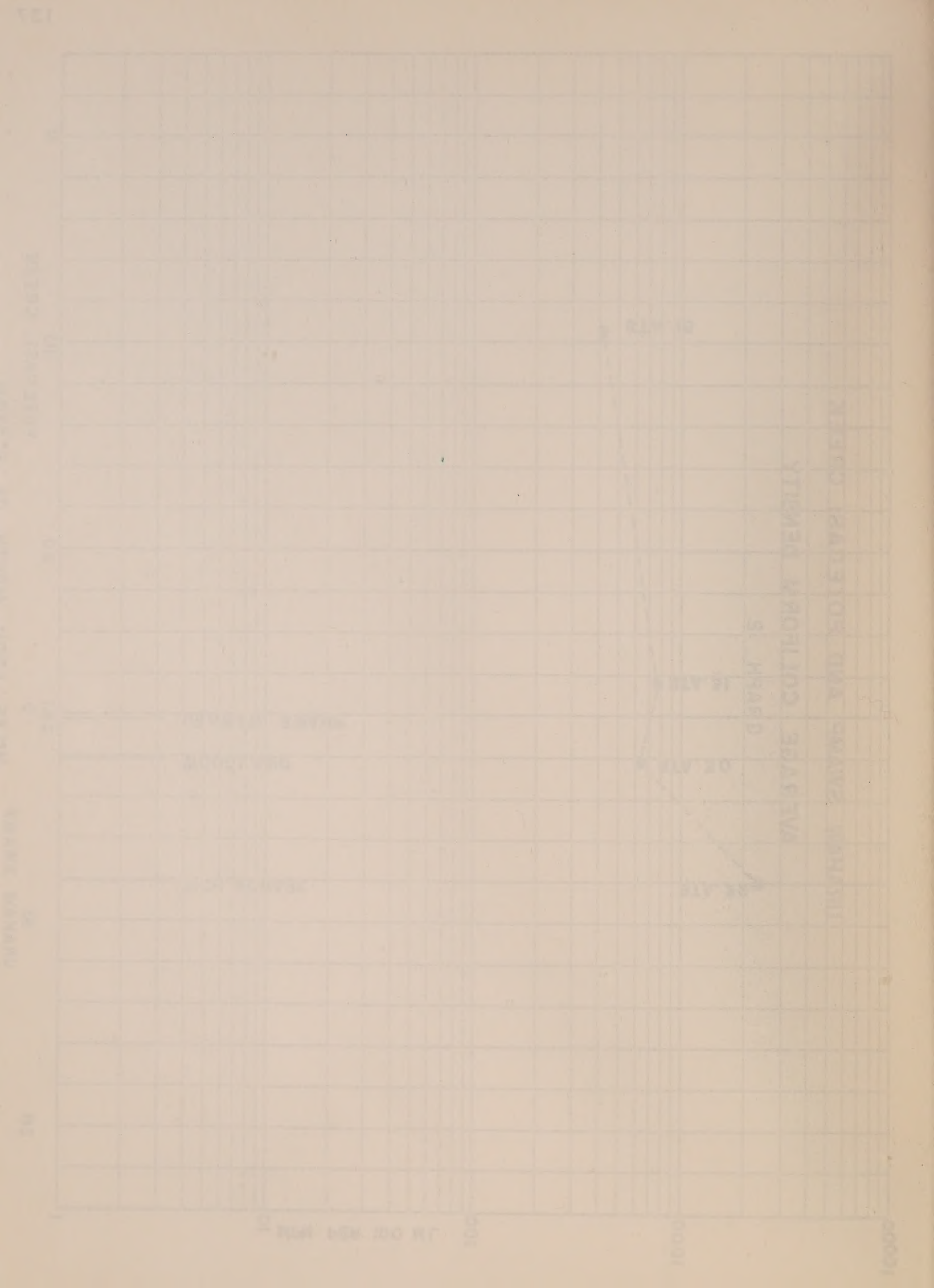

CHOWAN RIVER
AVERAGE COLIFORM DENSITY
GRAPH 2
10000
1000
100
10
1
MPN PER 100 ML
STA. 6
STA. 18
STA. 20
STA. 21
STA. 27
WINTON
TUNIS
SAREN CREEK
WICCACON RIVER
BENNETTS CREEK
COLERAIN
EDENTON BAY
40
30
20
10
0
MILES FROM MOUTH OF STREAM

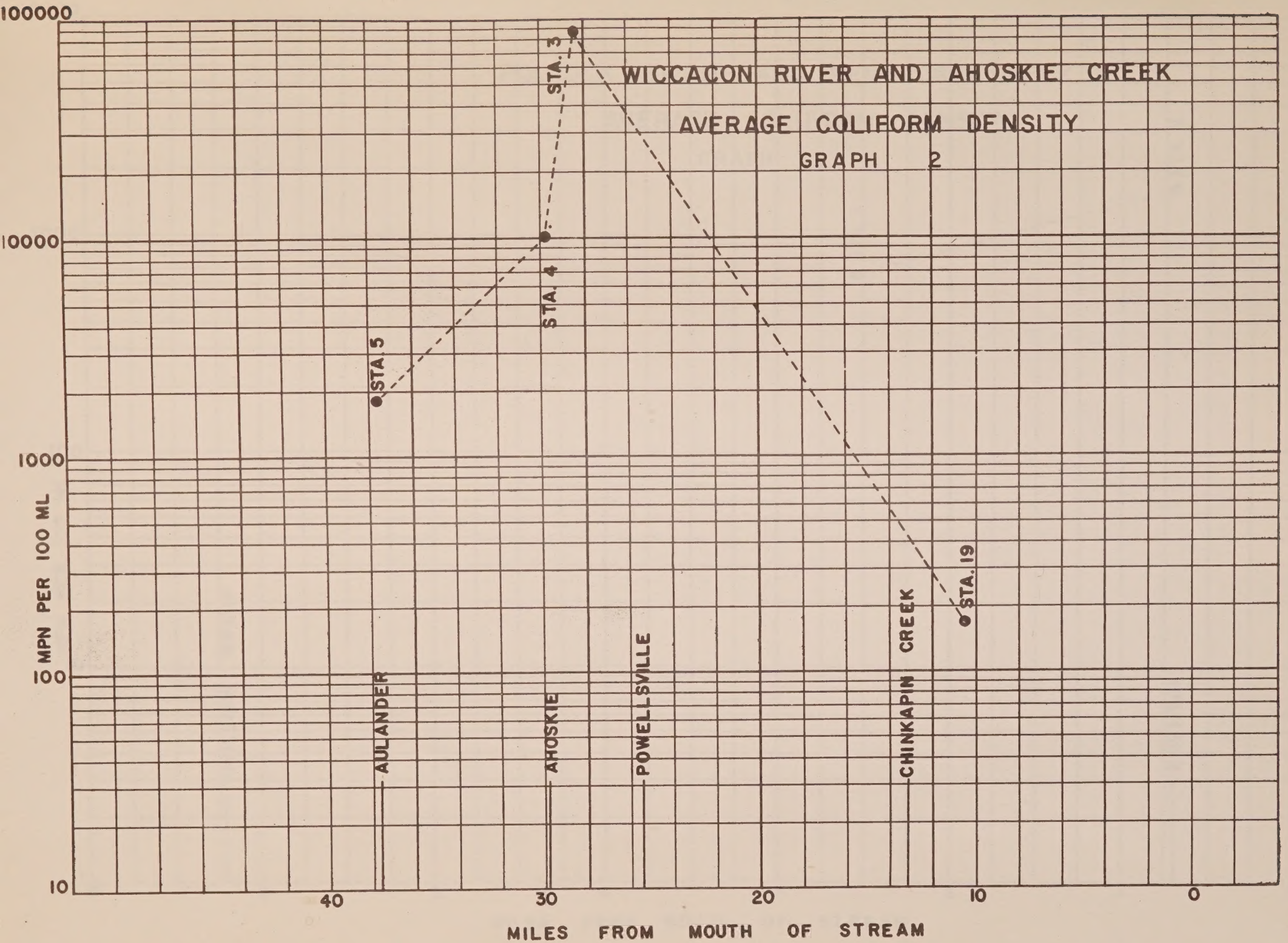


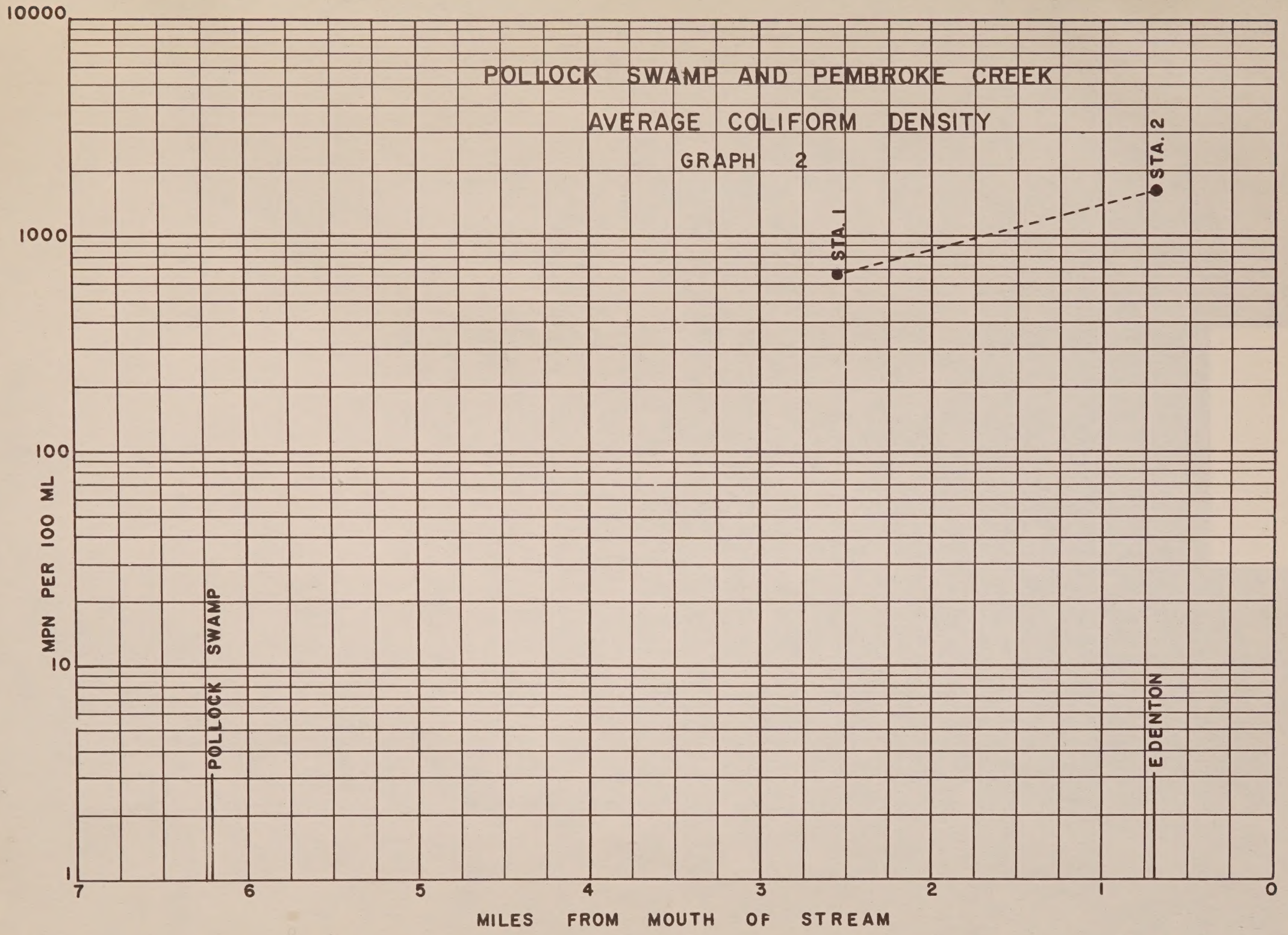

MEHERRIN RIVER AND CYPRESS CREEK
AVERAGE COLIFORM DENSITY
GRAPH 2
100000
10000
1000
100
10
MPN PER 100 ML
STA. 12
STA. 11
STA. 10
STA. 9
STA. 13
STA. 14
STA. 16
MARGARETTSVILLE
CYPRESS CREEK
SEVERN
KIRBY CREEK
MURFREESBORO
POTECASI CREEK
10
0
42.1
40
30
20
10
0
CYPRESS CREEK
MEHERRIN RIVER
MILES FROM MOUTH OF STREAM




URAHAW SWAMP AND POTECASI CREEK
AVERAGE COLIFORM DENSITY
GRAPH 2
STA. 29
STA. 30
STA. 31
STA. 15
10000
1000
100
10
1
MPN PER 100 ML
RICH SQUARE
WOODLAND
URAHAW SWAMP
20
10
0
URAHAW SWAMP
28.1
20
10
0
POTECASI CREEK
MILES FROM MOUTH OF STREAM




WICCACON RIVER AND AHOSKIE CREEK
AVERAGE COLIFORM DENSITY
GRAPH 2
100000
10000
1000
100
10
MPN PER 100 ML
STA. 3
STA. 4
STA. 5
STA. 19
AULANDER
AHOSKIE
POWELLSVILLE
CHINKAPIN CREEK
40
30
20
10
0
MILES FROM MOUTH OF STREAM


POLLOCK SWAMP AND PEMBROKE CREEK
AVERAGE COLIFORM DENSITY
GRAPH 2
10000
1000
100
10
1
MPN PER 100 ML
STA. 1
STA. 2
POLLOCK SWAMP
EDENTON
7
6
5
4
3
2
1
0
MILES FROM MOUTH OF STREAM

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